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EXCERPT FROM WRITINGS OF THE BYZANTINE GREEK PHYSICIAN, ALEXANDER OF TRALLES.—Alexander's work influenced the development of medicine and bears evidence of a truly pioneer spirit in an age of mental stagnation and slavish acceptance of authority. His medical writings are based upon Galen, whom he always calls "most divine." Nevertheless, he supplements and even criticises the treatment prescribed by this high authority when his own wide practical experience forces him to differ. In the extract here reproduced he differs from Galen, who in certain cases prescribed "drying" and "heating" medicines, such as mithridate, theriaca, etc., even while he admitted that all the patients thus treated had died. Remaining adamant in his opinion, Alexander thus apologises for contradicting his master: "Herein is illustrated the truth of the word once spoken by Galen himself of Archigenes; 'He was a man and it is therefore difficult to assume that he never erred.'"

μέμνηται δὲ καὶ ὁ θειότατος Γαληνὸς οὐ λίθου ἀναπύσαντός τινος, ἀλλὰ χαλαζίοις παραπλήσια καὶ ἄλλων τινῶν ἀναπυσάντων ἐοικότα χολῇ τὴν χροιάν. καὶ θαυμάζω, πῶς αὐτὸς οὐδενὶ τῶν ἐμμυσχόντων ἠδυνήθη χρήσασθαι, ἀλλὰ ταῦτα μὲν ἔφυγεν. ἐχρήσατο δὲ μᾶλλον τῇ θερμαινούσῃ ἀγωγῇ — 'τήν τε γὰρ) Μιθριδάτειον αὐτοῖς παρεῖχον', ὡς αὐτός) φησι, 'καὶ τὴν ἀθανασίαν καὶ τὴν ἔτι μᾶλλον ξηραίνειν) δυναμένην θηριακήν' — καὶ πάσαις ταῖς ἄλλαις ἀντιδότοις ταῖς πρὸς τοὺς ἀσθματικοὺς ἀναγεγραμμέναις διὰ ὁριμέων τινῶν καὶ λεπτυνόντων συγκειμέναις φαρμάκων. οὐ μόνον ἐφ' ἑνὸς ἀνδρὸς, ἀλλὰ καὶ ἐπὶ πλειόνων ἑωρακέναι αὐτά φησιν· οὐδένα δὲ δυνηθῆναι) τῶν τὰ τοιαῦτα παθόντων,) ἐκφυγεῖν τὸν θάνατον, ἀλλὰ πάντας ἀπολέσθαι ὀλίγῳ πλείονα χρόνον ἢ ἐλάττονα διαρκέσαι δυνηθέντας. ἀλλ' ὄντως ἀληθές ἐστιν ἐκεῖνο τὸ λεχθὲν ὑπὸ αὐτοῦ περὶ Ἀρχιγένους· 'χαλεπὸν γὰρ ἄνθρωπον ὄντα μὴ καὶ διαμαρτάνειν ἐν πολλοῖς, τὰ μὲν ὅλως ἀγνοήσαντα, τὰ δὲ κακῶς πράναντα

DATE · A.D. 525—605 (Modern Text)

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ACTION ON THE HUMAN UTERUS OF ANAESTHETICS AND OTHER DRUGS COMMONLY USED IN LABOUR.

BY

ALECK W. BOURNE, M.B., B.CH., F.R.C.S.,

OBSTETRIC SURGEON, QUEEN CHARLOTTE'S HOSPITAL; OBSTETRIC SURGEON TO OUT-PATIENTS, ST. MARY'S HOSPITAL;

AND

J. H. BURN, M.D.,

DIRECTOR OF THE PHARMACOLOGICAL LABORATORIES, PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.

(From Queen Charlotte's Hospital.)

We have previously described[1] a simple apparatus for recording graphically the changes in the intrauterine pressure taking place during labour. It consists of a disc-shaped rubber bag attached to the end of a gum-elastic catheter, and connected by a long rubber tube to a mercury manometer. When the bag and the tube are filled with water small changes of pressure exerted on the bag are accurately transmitted to the manometer and recorded on the surface of a slowly moving drum. The bag with attached catheter, carefully sterilized, is inserted with full aseptic precautions through the os uteri so that the bag comes to lie between the membranes and the wall of the uterus in a position well past the head of the foetus. For the insertion it is necessary that the patient has begun labour and that the os is dilated to a diameter of about one inch. By the aid of this apparatus we have previously obtained some evidence[1] about the dose of pituitary extract, measured in units, which may safely be administered before the birth of the child, and have also investigated the action of the alkaloids of ergot, and of the separated principles of pituitary extract, oxytocin, and vasopressin.[2]

We now describe records showing the effect of the anaesthetics chloroform, ether, nitrous oxide, and stovaine, of morphine, and of atropine, and finally of quinine.

THE ACTION OF ANAESTHETICS.

The value of anaesthetics in labour has been much discussed in recent years, but in none of the discussions has there been any reference to the action of anaesthetics on the behaviour of the uterus itself. It seems elementary that for any final decision on the part which should be played by them in labour there should be a clear mental picture of what this action is.

Chloroform.

Figure 1 is a record showing the effect of administering chloroform on an open mask to a patient in the first stage

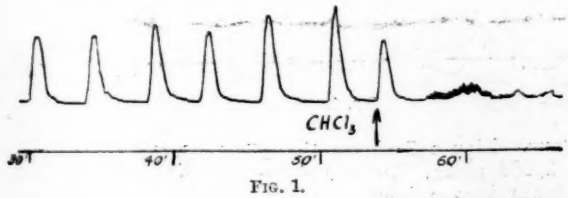

FIG. 1.

of labour. In the record the uterine contractions, shown as a rise and fall of the writing point, were proceeding regularly during a period of about twenty-five minutes. Chloroform was administered at the arrow; it is seen that the contraction which began at the first moment of administration was less than the others in height, and that thereafter there were no contractions at all during the remaining twelve minutes of the record. It is evident that chloroform caused complete arrest of the pains. Now to see that so powerful an inhibitory action is not peculiar to the first stage of labour the result in Figure 2 may be examined. The record shows the characteristic rises of pressure within the uterus which are so different from those of the first stage. Superimposed on the rise due to the uterine contraction itself are further rises due to increased intra-abdominal pressure. Since some teachers state that these "bearing down" pains are voluntary, it may be as well to point out here why this is most unlikely. In our experience of a total of nearly fifty patients, the superimposed rise has only very occasionally been seen during the first stage of labour; it begins sharply with the second stage, and is then seen with every pain until delivery. It is inconceivable that a voluntary effort would be distributed in this way. Cook[3] has shown, moreover, that in the fully anaesthetized rabbit at term the entrance of the presenting pole of the foetus into the vagina is accompanied by a very powerful contraction of the diaphragm and abdominal muscles. It seems likely that the superimposed rises of pressure in the human tracings are similarly due to reflex diaphragmatic contractions initiated by the passage of the foetal head down the vagina.

In Figure 2 the administration of chloroform on an open mask during a fully developed second stage at once slowed

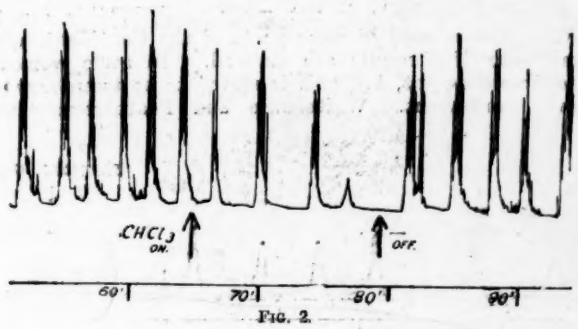

FIG. 2.

the frequency of the pains and reduced their height. During the last five of the fifteen minutes' administration there were no contractions at all. At this time the patient was not yet in full surgical anaesthesia, for there was considerable rigidity. Perhaps the most noteworthy feature of the tracing was the rapid recommencement of the contractions when the mask was removed; after about two minutes' delay a series of contractions was recorded almost as great in height and rate as at first.

Ether.

There is a belief among some that ether is a stimulant to the uterus. The picture of its action given in Figure 3 shows that the belief has no foundation. The patient was in the first stage of labour, and the administration of ether, like that of chloroform, at once diminished the frequency and force of the contractions; when the anaesthetic was discontinued they rapidly resumed their previous size.

The action of both chloroform and ether is most probably not a direct action on the uterus, for it is too rapid. In

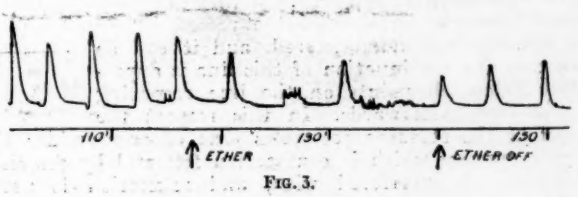

FIG. 3.

our opinion it is due to sympathetic stimulation which, during labour, is inhibitory. As evidence for this we point out that emotion arrests labour, and that, as we have already shown, an intravenous injection of adrenaline causes prompt cessation of the pains.[1]

Our evidence shows that the relief given in labour by a few breaths of chloroform or ether is not due only to the anaesthetic action, but at least as much to a diminution in the force of uterine contractions. Chloroform or ether is an ideal agent whenever a temporary brake on too powerful or too painful expulsive forces is required.

Nitrous Oxide and Oxygen.

Figure 4 shows the record of a patient in whom anaesthesia with nitrous oxide and oxygen was induced during twenty minutes. The contractions in this patient were not so regular in height and frequency as they commonly are, but nevertheless the complete absence of any effect of the anaesthetic on the contractions is evident. "Gas and

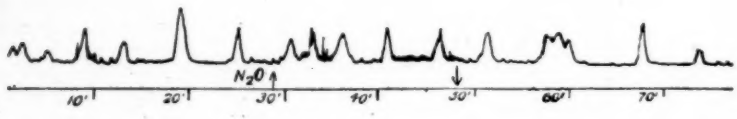

FIG. 4.

oxygen," therefore, is an anaesthetic which anaesthetizes without interfering with the progress of labour; in this important respect it stands in complete contrast to chloroform and ether.

Spinal Anaesthesia.

Spinal anaesthesia is not much used in this country, but is greatly used in some parts of the Continent, where very successful results are claimed. In some women it produces a squint, but this is stated to be temporary and never permanent. Whitehouse and Featherstone[3] some years ago described the effect of injecting tropacocaine into the spinal canal. They said that "when the lumbar cord is paralysed by the drug the uterus always contracts, and it does not relax until the drug ceases to act." Further, they pointed out that "the lower uterine segment and cervix also appear to be involved in the increased uterine tone." More recently Metzger[4] has stated that the intraspinal injection of 0.7 c.cm. of a ten per cent. solution of stovaine provokes a hypertonus of the uterus and that very rapid dilatation occurs. On the other hand, Cheval[5] says that spinal anaesthesia delays labour, for the os will not dilate by itself. We have examined the effect of stovaine in one patient, and the record obtained suggests the explanation of the statements made. The dose injected was 0.05 gram. Figure 5 shows that while the rhythm of the main uterine contractions was not perceptibly altered, there was a maintained rise of pressure in between each contraction. A line has been drawn through the base of the record before the stovaine was administered, and it can be seen that the continuation of this line is appreciably below all points on the line recording the pressure afterwards. In this respect the action of the stovaine resembles that of ergotamine; the normal process, which is contraction followed by complete relaxation, is interfered with, and relaxation is never complete.

Hence our experience agrees with that of Whitehouse and Featherstone, our method of recording the intra-uterine pressure enabling us to analyse the effect more closely. It is clear that if stovaine be injected early in the first stage before dilatation has advanced very far, this contraction of the lower segment will hamper further dilatation, as Cheval has found. On the other hand, if the dilatation is complete, the "hypertonus" described by Metzger will be apparent, and delivery will be hastened.

Morphine.

In Figure 6 is shown a record of a patient to whom an injection of 1/4 grain of morphine was given during the first stage of labour. During the first quarter of an hour after the injection there was no change in the contractions, but thereafter there were two important differences. In the first place, the relaxation of the uterus after each contraction was much slower, and in the second place, the frequency of the contractions was less than before. It is readily understandable that the first of these changes, both of which were observed in a second patient in similar circumstances, may be of considerable value in accelerating the progress of labour, for if the relaxation from each contraction be slower it follows that the time during which useful work in dilating the os is performed must be considerably increased. Yet the continuous pain to which such a prolongation of the contraction must ordinarily give rise is precisely the type of pain from which morphine gives relief. Hence morphine is an agent which, by prolonging the duration of contractions, may accelerate the progress of labour, and yet not add to the embarrassment of the patient in doing so.

Though we have had the same result in two patients, clinical experience indicates that the action of morphine is not always the same. How far a difference in the action on the central nervous system of different patients is correlated with a difference in the action on the uterus we are unable to say.

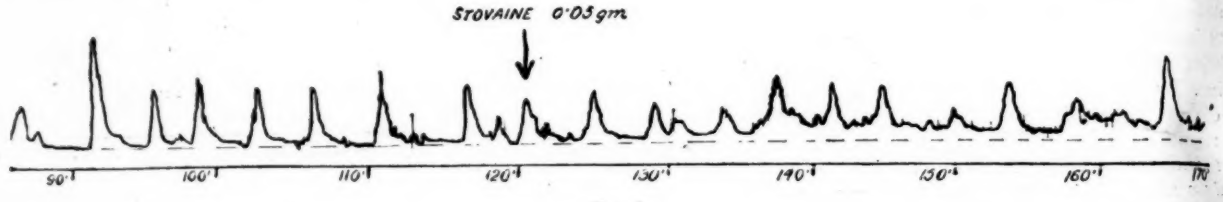

FIG. 5.

Atropine.

The view has been expressed that atropine should not be used as a prelude to anaesthesia in parturition, because it may produce an inhibition of the uterus. This opinion would be more reasonable if it had ever been shown that the uterus has a nerve supply by way of the sacral autonomic fibres for the transmission of motor impulses. A paralysis of uterine contraction could then occur from the paralysis of the nerve endings which atropine would produce. No such motor nerve supply has been found; nevertheless it remained a matter of interest to determine whether atropine in ordinary dosage had any action

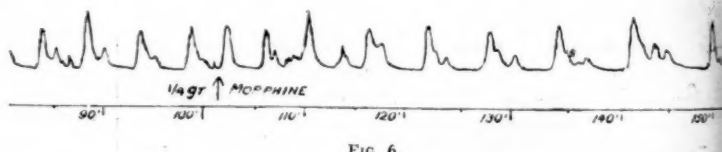

FIG. 6.

labour. Figure 7 shows the effect of the administration of 1/100 grain. To our surprise the record showed an increase in the height of the contractions characteristic of the passage from the first to the second stage of labour. It is perhaps unwise to conclude from this single instance that the increased height was really due to the atropine for the injection may by chance have coincided with a change which would have taken place anyhow. It is however, quite safe to say that atropine, in the dose given displayed no trace of an inhibitory action.

Quinine.

Quinine is largely used when it is hoped to induce labour but few obstetricians appear to find it useful. Rübsamen

actually investigated its action by the use of a recording system attached to the abdomen of patients in labour, and concluded that whereas it had little effect before labour had begun, it reinforced the pains afterwards. Our own experience has been more depressing than this, for results obtained on two patients both show very little

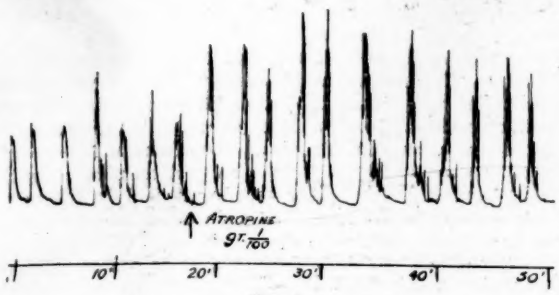

FIG. 1.

effect of a kind calculated to hasten delivery. In Figure 8, 10 grains of quinine bihydrochloride were injected into the gluteal muscles of a patient in the first stage. The main effect of the injection appeared to be that the periods of relaxation between pains became shorter, so that contrac-

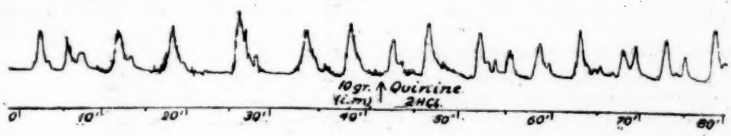

FIG. 8.

tions were more frequent, but that the height of each contraction was less than before. It was surprising that there was no clear indication of a stimulation of the uterus by the quinine in the same way as there is when a small dose of pituitary extract or a large dose of histamine is injected. It is evident that the powerful action of quinine on isolated portions of smooth muscle when suspended in a bath is little guide to its effect on the uterus in labour, and that its action on the parturient human uterus has been much overstressed.

DISCUSSION.

The importance of a knowledge of the effects of anaesthetics both on the uterine action and on the patient's general state is considerable, especially at present when much attention is being devoted to the problem of alleviating the pain of labour.

We will first recapitulate the advantages and disadvantages which are agreed to attach to chloroform, ether, and gas and oxygen respectively as general anaesthetics. Chloroform produces its effect in the smallest concentration. Attending its use there is a risk of sudden death from cardiac fibrillation, and a more important risk of delayed chloroform poisoning. We understand that in the United States it is now very little used at all. Ether has the disadvantage of inducing infections of the pulmonary tract. Both chloroform and ether cause damage to the circulation by producing a degree of capillary paralysis proportional to the length of time they are administered, as was shown by Dale.[7] Gas and oxygen has none of these drawbacks, but it is expensive; its administration requires much more skill and attention, and it cannot ordinarily produce a full degree of surgical anaesthesia.

These are the points involved in considering the production of general anaesthesia. In midwifery, however, different varieties of anaesthesia are required. Light anaesthesia is most commonly wanted for the end of the second stage; secondly, prolonged light anaesthesia may be wanted throughout the whole of the second stage; finally, full surgical anaesthesia may be required. For light anaesthesia at the end of the second stage the arguments given above relating to general anaesthesia do not apply, and we think that chloroform or ether is suitable. The amount of chloroform which needs to be given is very small, and the reduction in the efficiency of the contraction which it causes is often of benefit in avoiding perineal tears. Experience at Queen Charlotte's Hospital since this form of anaesthesia has been used in normal labours shows that there has been no appreciable prolongation of the second stage, nor increased incidence in the forceps rate. In a series of 562 cases there has been no increase in the incidence of post-partum haemorrhage when compared with a previous series of the same number without anaesthetics, and there has been no case of chest complication or delayed chloroform poisoning. The condition of the infants was materially the same whether anaesthetics were used or not.

For prolonged light anaesthesia, throughout the whole of the second stage, the use of chloroform or ether is open to more objection. Boyle[8] has recently made a strong plea for the use of gas and oxygen in place of chloroform, for he says that patients are far less exhausted and that the pains are not slowed. The question seems to us to depend on the amount of chloroform to be used, and we think that in many circumstances Boyle is right. But in domiciliary practice, at any rate, the weight and expense of the necessary apparatus render gas and oxygen very difficult for routine use.

When full surgical anaesthesia is required, we think that whenever possible ether should be substituted for chloroform, combining the ether with the hypodermic injection of atropine. It is to be remembered, however, that ether is highly inflammable, and the risk of explosion in an ill-ventilated room with an open gas fire may be considerable. But from the point of view of the patient there seems little doubt that the use of chloroform is not in keeping with modern enlightenment.

SUMMARY.

1. Records of intrauterine pressure have been obtained showing the effect of anaesthetics and other drugs on the contractions during labour.

2. The administration of chloroform or ether on an open mask at once arrests the contractions in the first stage, and diminishes their force and frequency in the second stage. The effect comes on rapidly, and passes off rapidly when the administration is discontinued. The action of ether is the same as that of chloroform.

3. The administration of gas and oxygen has no effect on the contractions during labour.

4. The intraspinal injection of stovaine does not inhibit the contractions, but interferes with full relaxation between the pains. This appears to be due to continuous contraction of the lower segment, and if stovaine be given early in the first stage dilatation will be delayed.

5. Morphine lessens the frequency of uterine contractions, but the pains pass off more slowly, so that the work done by the uterus is probably as great as or greater than before, despite the lessened frequency.

6. Atropine appears to stimulate the contractions of the uterus. It certainly has no inhibitory action.

7. The stimulant action of quinine during labour is very small.

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The Morison Lectures

ON

NERVOUS SEMEIOLOGY, WITH SPECIAL REFERENCE TO EPILEPSY.

DELIVERED BEFORE THE ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH ON JUNE 2ND, 3RD, AND 4TH, 1930,

BY

S. A. KINNIER WILSON, M.D., F.R.C.P.,

NEUROLOGIST AND LECTURER IN NEUROLOGY, KING'S COLLEGE HOSPITAL; SENIOR PHYSICIAN TO OUT-PATIENTS, NATIONAL HOSPITAL, QUEEN SQUARE.

LECTURE III.—SYMPTOMS INDICATING INCREASE OF NEURAL FUNCTION (*continued*).

LOWEST LEVEL FITS.

As already explained, this term is taken in a wider sense than that given it by Hughlings Jackson, and made synonymous with "infracortical fits."

The question whether the neural site of *general* epileptic seizures is of necessity always the same has received some attention, and been examined by myself elsewhere (ref. 19, Lecture II). Briefly, it amounts to this: can their motor phenomena be produced at other (lower) levels than the cortical? The experimentalist has shown that in the decorticate or decerebrate animal fits of a general kind can in point of fact be made to develop by resort to convulsants such as absinthe or thujone; and the distinction sometimes still advanced by the clinico-anatomist, that the clonic element in fits is of cortical origin, the tonic of infracortical, cannot be upheld in its entirety. Both tonic and clonic convulsions have been produced by Pike and Elsberg[30] in animals deprived bilaterally of the cortical motor areas, an interval of time sufficient for the return of "good locomotor reactions" being allowed to elapse after operative intervention; Dandy,[31] it is true, claims to have proved that in the dog the cortex is required for the clonic component. In full decerebration, with only pons, medulla, and cord left, convulsions of a more or less general kind may develop during the respiratory sinking that presages the death of the preparation. But whether these are identical *in all respects* with those occurring experimentally in the intact animal can be settled only by precise observation, and so far as I am aware this has not yet been forthcoming. In regard to man the evidence undoubtedly points to important differences between fits of higher and of lower origin, as we shall see.

Taking our stand on the position that fits of any kind are fundamentally expressive of the functions of the part or parts affected, we must at once allow for the greatest diversity and heterogeneousness. A major attack ranges from a disturbance on the highest plane (the aura) to phenomena of a visceromotor kind, through the whole scale of semeiology; and fits ostensibly caused by disorder in infracortical mechanisms cannot do otherwise than reveal the functions which these possess. The clinician tries to deduce the localization of a given attack by scrutiny of its functional features, correlating what he observes with knowledge otherwise derived. Facts compel us to admit that the property of uncontrolled discharge is common to all nerve-cell groups on occasion, even though we draw a distinction between permanent instability in a diseased tissue and occasional instability in a healthy tissue; and it stands to reason that if this generalization is accepted we may expect such syndromes as are specific for mechanisms of a given level. But one of the difficulties immediately encountered is to decide whether the observed phenomena partake of the general characters of a "fit." I confess this interpretative question becomes almost impossible to answer in any completely satisfactory fashion. The expression "genuine" epilepsy is little short of meaningless; such epilepsies as grand and petit mal are usually recognizable—the Jacksonian variety too—but clinical manifestations of analogous release or excitation in other divisions of the nervous system do not always convince the observer of their right of admission to the general category. Sometimes I envy the man in the street, who can talk of his symptom as a "turn," a "go," a "do," non-committally yet graphically, whereas science compels the neurologist at least to try to give it a local habitation and a name in conformity with its physiology and nosology. As neural semeiology consists simply of hyper- and hypo-activity it is open to the clinician to claim any temporary, disorderly, paroxysmal, recurrent, uncontrolled manifestation of either motor or sensory processes as in essence a "fit," and this on any physiological plane. Does not common parlance permit the phrases "a fit of the blues," "a fit of temper," "a fit of laughter," and so forth? Then why not a fit of neuralgia, of tachycardia, of polyuria? Unfamiliar and possibly bizarre though such conceptions may seem, they do not differ integrally from "a fit of asthma" or "a fit of sneezing," which some will concede are allowable. Provided the phenomena partake of the general nature of a "fit" as just mentioned, with a substratum of physiological escape, it will be difficult to deny their intrinsic likeness to each other however protean their external aspects.

Such general comments are apposite to the question now before us, which can be approached by discussion of various infracortical groups.

"*Striatal Epilepsy.*"

Within recent years the term "striatal epilepsy" seems to be enjoying a certain vogue. In 1925 Professor August Wimmer[32] of Copenhagen recorded the case of a patient whose symptoms commenced by attacks of unilateral tonic spasm, lasting a few seconds, unattended by loss of consciousness, and recurring many times a day. Later they became generalized, and an eventual diagnosis of epilepsy was made. At a subsequent period involuntary movements of an athetoid type made their appearance, and finally the clinical picture became one of typical torsion-spasm. Because of the possibility of the latter condition having a striatal basis, Wimmer designated the tonic attacks and (more or less tonic) generalized fits "striatal epilepsy," supporting his contention by reference to a case observed by Stertz,[33] in which generalized seizures preceded the development of torsion-spasm and the lesions discovered post mortem were confined to lenticular and caudate nuclei. He also found substantiation for his argument, as he maintained, in the occurrence of epileptic attacks along with post-encephalitic Parkinsonism. Preferring the expression "subcortical epilepsy," Spiller[34] published in 1927 two cases of attacks of brief tonic spasm—in one, affecting both hands and a lower limb; in the other, the arm and leg on the same side. These spasms (no clonic element was in evidence) were brought on by voluntary movement of the limbs concerned in both instances, and in one could also be elicited by passive manipulation; further, the muscular contractions were painful and accompanied by a thermal dysaesthesia of "heat" or "burning" in the lower limb unaffected by the spasm. Because of a concomitant cervical sympathetic palsy in the case that ended fatally (no necropsy being allowed) Spiller suggested a lesion in the regio subthalamica, possibly haemorrhagic (there had been evidence of meningeal bleeding in the case at an earlier stage). Still another term, "extrapyramidal epilepsy," has been proposed, by Sterling,[35] for cases of spastic contractions in the course of post-encephalitis or during a more acute period, distinguished by painful spasms of fingers or toes, limbs or segments of limbs, and inclusive of facial and torticollic movement; brief or prolonged, the muscular phenomena are essentially intermittent and often paroxysmal, and their frequently "tetanoid" or "tetaniform" character is stressed in the title of his paper.

This plausible association of tonic spasms or painful spasmodic contractions with destructive lesions of the corpus striatum must, however, be examined under very considerable reserve. Naturally I accept any view ascribing tonic spasm to the group of the epilepsies in a general way, provided it occurs in "bouts" or "fits," so to say; but when the element of pain enters prominently into the motor contractions the case is somewhat altered. Clinically speaking, not a few of the examples cited, more especially by Sterling, can be fairly assigned to that class of painful cramps, and it seems inadvisable to widen the horizon of the epilepsies, almost limitless though that may appear to

be, by inclusion of a clinical category of such distinctiveness; equally well might we place the phenomena of intermittent claudication in the same collection. By common consent tetanus and tetany remain outside the epileptic rails, yet one of Sterling's examples of "extrapyramidal epilepsy" presented contractions of the hands and fingers, occurring daily for nine days and lasting two to three hours, exactly like those of tetany. Similarly, in the peculiar cases we owe to Spiller the facts that the muscular contractions themselves were dolorous and (in particular) that they arose in consequence of active, voluntary movement, in my opinion render their ascription to any of the epilepsies, as ordinarily understood, more than a little dubious. Painful reflex spasmodic phenomena occur under a variety of different circumstances; the cramps of cholera are etiologically distinct from those of ballet dancers or swimmers, which ensue on voluntary movement, and each from those of encephalitis; but they are clinically alike in the elements of paroxysmal painful tetanic muscular contraction; and we should proceed warily in the matter of regional allocation. I share Spiller's own clearly expressed hesitation as to the precise nature of the symptom-complex in his cases and his unwillingness to accept a striatal origin for them.

Further, on previous occasions I have animadverted on the irrational attribution of motor phenomena to affection of the corpus striatum merely because of their occurrence in the course of epidemic encephalitis, and I take the opportunity of underlining again this *non sequitur*. Implication of the pyramidal system for spasmodic syndromes is not excluded because Parkinsonism and its rigidity may be indirectly due to striatal lesions. So far as I have noticed, the obvious comment has not been given any consideration, that such tonic spasms, being release or excitatory symptoms, cannot result from outfall of striatal cells. Neither the generalized fits nor the torsion-spasm of Stertz's case can have been *caused* by the destructive lesions of the caudate and lenticular nuclei found on microscopical examination by Spielmeyer. It is immediately plain that the actual mechanisms involved in the production of these tonic movements must have occupied an extrastriatal position.

There is no novelty whatever except its proposed name in this conception of "striatal epilepsy." Reference to the old descriptions of Ormerod and Gowers in respect of their cases of lenticular degeneration (quoted in my monograph[36] on the subject) shows that "tonic spasms" were even then recognized as forming a part of the clinical picture. Gowers employed the epithet "tetanoid" for the contractions in his cases, and said of the first that "the muscles of the neck, trunk, and limbs were all involved, in varying degree, in the generalized tonic spasm"; and, again, "the spasmodic contractions of the musculature became intensified," etc. The value of this old clinical evidence of the development of tonic contractions in the course of a striatal affection is in no sense diminished by our inability to attribute them directly to striatal cell-fibre systems. I have myself from time to time observed analogous cases, though they have never been reported. One may be selected for illustrative purposes; the patient came under my care in 1923, two years before the publication of Wimmer's interesting paper.

A boy, 5 years old, noticed to have been more or less "fidgety" since birth, but with no previous illness except German measles, began to suffer from indefinite involuntary movements with a propensity to affect the left limbs and side. They offered some resemblance to choreo-athetosis without being quite characteristic of either subgroup. After a year or two it was observed that, following any insignificant jar, knock, fright, or excitement, the boy lost power down the left side for two or three minutes; the left leg inverted and assumed an equinus position, while the left arm flexed at the elbow and was held in front. Unable to speak, he did not lose consciousness. The attack was very often (not, it appeared, invariably) preceded by a sensation of pain starting in the left foot and passing up the trunk to the shoulder and then coming down the left arm to the hand. When the sole of the left foot was stimulated (as in testing the plantar response) an inversion spasm of the limb took place, while pain was experienced and shot up as high as the left shoulder.

On minute examination, however, no definite objective sign of organic nervous disease was discovered.

The boy has been under my continuous observation now for more than seven years, and I have seen a number of the tonic attacks, which can be thus succinctly described: the left foot extends and becomes inverted, the left leg is in tonic extension, the head is bent over to the left and the trunk arched slightly, with concavity to that side; the arm is flexed at elbow, somewhat abducted at shoulder, and stiff throughout, while the fingers are commonly flexed. Some spasm of the left orbicularis oris is observable, but the mouth is not drawn over. Consciousness is preserved; the boy does not drop anything he holds in the affected hand, yet does not answer questions while the attack is on. Its duration has gradually become shorter, now lasting no more than thirty seconds. By 1929, at length, signs of change apart from the fits made their appearance, in the form of enduring rigidity and some weakness of the left leg; and at the present time the facies and ensemble are indicative of a mixed pyramidal and extrapyramidal affection—a slight unilateral paresis and equally slight suggestion of Parkinsonism.

On purely theoretical grounds this unusual case can be represented as one of *reflex unilateral tonic epilepsy*, and feasibly be thought infracortical in origin, mainly, no doubt, because of its tonic type; but I do not myself consider the symptoms can be attributed to excitation of striatal arcs. The aura follows a physiological "march" corresponding to the arrangement of centres in the post-Rolandic cortex, while the extension and equino-varus postures of the left leg are of pyramidal type. Pain of cortical derivation is not unknown, and the reflex nature of many of the fits rather favours a similar site for them, as I think; at least, the element of conscious perception of the stimulus is not excluded from acoustico-motor and other reflex epilepsies adjudged by some to develop at lower levels. But still, the absence of the clonic element impresses, even if strict proof is awanting of the striatal or extrapyramidal locus of the spasms. In this connexion we do well to remember that when in Jacksonian epilepsy the "second side" becomes implicated, its contractions are sometimes tonic rather than phasic, and take the whole side much more quickly than in the case of the one first involved. I have had under care recently a little girl whose epileptic attacks throw the left limbs and face into clonic spasms, with head and eyes deviated to the left, but the right arm and leg remain in tonic extension, and the abdominal muscles of the two sides are boarded in strong tonic contraction equally, without twitches. Until further study enlightens us it is premature, in view of what has already been said by way of criticism of the "striatal" conception, to assign tonic manifestations to activity of the basal ganglia when we know they can also develop in other ways, as is now to be discussed.

Tonic ("Cerebellar") Fits.

The occurrence of general tonic seizures (leaving aside the mainly segmental and unilateral tonic spasms to which some attention has been given above) has long been a neurological commonplace. Described by Hughlings Jackson as "tetanus-like seizures," sometimes as "cerebellar fits," in their essence they consist of tonic contraction of extensor groups of trunk and limbs, with temporary head retraction and opisthotonos; occasionally the upper extremities are flexed rather than extended, and emprosthotonos may take the place of the other. A full description of a number of such cases was published in my paper[37] entitled "Decerebrate rigidity in man and the occurrence of tonic fits" (1920), and various others gathered from a somewhat sparse literature were referred to. Since that time more have come under personal observation, while from his wide experience Foerster[38] has collected a series of the same kind; Martin,[39] too, has published an interesting quartette of cases of pure tonic fits in association with syringomyelia, attributing them with some plausibility to rise of intracranial pressure and internal hydrocephalus—no uncommon finding in the disease.

Speaking generally, haemorrhage, abscess or tumour of the cerebellum, or of pons, medulla, and cerebral peduncles, haemorrhage or rupture of an abscess into the ventricular system, meningitis, and other basal conditions calculated

to interfere with fluid circulation between that system and external arachnoid spaces, are among the pathological conditions apt to be causative of generalized tonic fits. Their association with a state of decerebrate rigidity is far from infrequent; in such cases they occur as temporary exacerbations, accentuating and exaggerating the background of tonic posture in extension. Again speaking generally, it can be shown that fits distinguished by the assumption of tonic attitudes and the appearance of tonic contractions are most likely to develop when the lesions of the case dissociate physiologically the cerebral hemispheres from cerebello-mesencephalo-pontine levels, and when, therefore, striatal function also is in complete abeyance. An instructive case which bears out this statement indirectly has been recorded by Reynolds[40]; it is that of a girl of 15 whose grand mal attacks, before any operation, consisted of "(1) tonic emprosthotonos, in which she remained rigidly anteflexed and silent for about twenty seconds; (2) as the trunk relaxed, the head and eyes commenced to jerk clonically to the right and the right hand entered into clonus. Then (3) the movements became slower and ceased, and she wept as if frightened," etc. He was able, by operating and draining the cerebral cortex above the tentorium, to dispel the clonic element altogether and leave only the basal tonic element; at this stage the fits continued as purely tonic and emprosthotonic in character for two weeks; after some twenty of these, bilateral suboccipital drainage of the arachnoid space immediately and permanently dispelled this residuum, and neither type of fit has recurred since.

In their elaborated form the picture is unmistakable, especially when evidence of coexisting organic nervous disease of one or other type as alluded to above is at hand. But brief tonic fits, not much more than a rather elaborate petit mal seizure, also occur, and deserve mention because of their unusual features. A recent case is that of a girl of 14, whose so-called "menstrual epilepsy" is as follows: a sudden inspiratory cry is succeeded by stretching out rigid arms in front while neck and back are contracted in powerful opisthotonos and she falls back with a crash, legs extended and stiff; cyanosis at once sets in, and involuntary micturition takes place. With almost equal abruptness the musculature relaxes, consciousness returns, and violent vomiting ends the attack. No clonic movement of any kind has ever been seen.

The close resemblance of the fits in this case to those of the patient of Wimmer (mentioned above) should not be overlooked; the latter comprised initial cry, generalized tonic contractions with loss of consciousness, cyanosis and tongue-biting, without, however, sphincter relaxation. Yet Wimmer, who himself diagnosed ordinary epilepsy at first, was influenced by the subsequent development of torsion-spasm and called the condition "striate epilepsy" accordingly. Since variants of this kind are encountered by themselves, "idiopathically," with undiscoverable causation, it appears to me improper, and for the reasons already advanced unjustifiable, to allot them any such topical designation.

At this point, too, another aspect of the question of tonic fits may not be out of place. The neurologist is aware that convulsive hysterical seizures no longer constitute a clinical banality. Nothing should appear to any thoughtful mind more evident than that hysteria follows the scientific movements of the day and adapts itself to progress in medicine. Hysterical fits in the grand manner are out of fashion. Years have elapsed since last I saw a typical case of the *arc de cercle*, and I remember that Babinski showed at a medical congress a cinematograph record of all the phases of the attack because he considered it would ere long become of purely historical interest! Now while hystero-epilepsy may assume any form, as it were, undoubtedly one special class of fit is distinguished by the patient's musculature becoming contracted in rigid extension, head retracted, back curved, arms extended and hyperpronated, legs extended, and feet inverted. Here I am interested not in the possible psychogenesis of the attack, but in its physiology. For there can be no doubt that it offers intimate affinities from the standpoint of *form* with what obtains in fully developed tonic fits attended by physiological decerebration. We commit ourselves to no theory of hysterical etiology in underlining the fact that the neurosis can have at its disposal only the existing sensorimotor processes of the individual patient; and it is legitimate to stress the symptomatological analogies between the two types when the *mechanism of production* of the symptoms is concerned. I well remember a hysterical patient who, when she entered the out-patient clinic, fell on her back in rigid extension, crushing her hat under the back of her head on the floor, toes down-pointed, arms straight out and pronated till the backs of her hands touched. Investigation revealed a wretched history of incest and psychical trauma, but the *form* of the attack is not explained thereby. The physiology of hysteria is one of many matters in neurology which call for serious research. I confess my ignorance of why convulsive hysterical manifestations partake so frequently of a tonic character; the once-debated question of the reality or otherwise of hysterical Jacksonian epilepsy seems now to be forgotten, presumably because it is thought to have been "decided" in the negative, but why then this mimicry of organic tonic fits?

Periventricular Epilepsy.

A final grouping of lowest level or infracortical *fits* includes those in which symptoms of an affective and viscero-sensorimotor kind predominate. Everyone who has made a study of epilepsy knows with what frequency symptoms referable to the neuro-sympathetic system are in evidence; momentary arrest of the heart's action, pallor, sialorrhoea, sphincter relaxation, and other analogous phenomena occur to the mind in this connexion. As the "discharging lesion" sweeps over different physiological levels or implicates a succession of physiological centres it does not appear in major cases to exercise any selectivity. Whether this is through representation of visceral activities at the highest physiological level need not at present detain our discussion; anatomically speaking, we know of sympathetic centres in the brain representing lower nervous arrangements, but so far they have not been traced with certainty to the cortex itself. We shall therefore take the attacks to be now considered as indicative of functional activity on an infracortical plane.

In the spinal cord a general division of cell-fibre groups into four systems or columns is obvious—namely, somatic sensory, somatic motor, viscero-sensory, and viscero-motor respectively. These are readily recognizable at prespinal levels—namely, in medulla and pons—and the point of interest to which attention is directed resides in the relation of the visceral and somatic-sensory columns, particularly, to the ventricles of the cerebrum. At the level of both medulla and pons they fringe the margins of the fourth ventricle; the thalami are lined by the third; and researches of recent years have thrown a great deal of light on the various visceral ganglionic collections skirting the floor and lower sides of the same third ventricle, as far back as the commencement of the aqueduct. That the major portion of these centres, concerned with *la vie affective* and *la vie végétative*, is situated round the ventricular system cannot be without significance. It is therefore permissible to speak in general terms of "periventricular epilepsy," by which may be designated cases remarkable for localization of the disorder in neuro-sympathetic centres, at least in major degree, to the exclusion (absolute or relative) of sensorimotor phenomena of somatic type.

The actual nucleus or focus of the "nerve-storm"—the "storm centre"—cannot perhaps be determined with any nicety, for if we are to conceive of the sympathetic system as an anatomical continuum (in accordance with the conclusions of Philip Stöhr[41] and others) it becomes difficult to ascertain whether peripheral or central cells form the starting-point; besides, as has been remarked in a previous lecture, we must postulate an open way between the focus and the percipient cortex, since in few of the seizures to be described is consciousness ever lost; on the contrary, the subject is only too acutely aware of some violent disorder referred to his viscera, and equally incapable of inhibiting it. The assumption must be that abnormal impulses *ascend*

to the cortex and are there interpreted as accurately or (for most instances) as imperfectly as may be, in accordance with previous experience or with want of it.

1. Prominent in the general category of affective or visceral epilepsies come the "fits" known (after Gowers) as "vaso-vagal attacks," or "pseudo-angina," or popularly as "nerve-storms"; in their physical concomitants they are akin to what the psychiatrist is nowadays in the habit of designating "anxiety neurosis." Cases exhibiting the syndrome to be described immediately have interested me for many years, and I have collected a large number from private and hospital practice; and in an article[42] on "epileptic variants" the subject has been given attention and analysis.

Briefly, to quote from that paper, "the patient complains of attacks of palpitation at the heart, difficulty in breathing, a suffocating sensation in the throat, hot flushes, icy coldness, sweating, shivering and trembling, nausea, and other epigastric sensations, and often, also, an indescribably distressing feeling of impending trouble, of fear, even of imminent dissolution." The symptoms of the vaso-vagal attack point in a general way to temporary functional disturbance referred to organs supplied by the pneumogastric nerve, presumably initiated in the vagal nuclei of the floor of the fourth ventricle and in the neighbouring vasomotor nucleus. But radiation along neuro-sympathetic paths therefrom is usual enough; in particular, polyuria and pollakiuria are very common at the close. One or two hitherto unpublished clinical cases will serve for purposes of illustration.

A. C. B., male, aged 58, suffers from fits commencing with flatulence and eructations, followed after a time by a sinking sensation at the epigastrium, thudding heart's action, vertigo, nausea, clammy sweating, and trembling of the body and limbs; an agonizing dread of something unpleasant about to happen develops when the attack is in full swing. Its duration is perhaps from fifteen or twenty minutes to two hours, during which (if it is rather prolonged) he will pass water freely, quite six times or even more. It may amount to a pint of clear, limpid urine the first time, but subsequent quantities are on a smaller scale.

This patient has a persistently low body temperature, ranging from 95° to 97.4° F.; on none of the various occasions when it has been taken by a medical man has it been higher.

Interesting features distinguish another case of the same class.

G. N., male, aged 47, has attacks in series, four to six a day for five or six days, with an interval of weeks thereafter. Lasting for about thirty seconds, they begin with a sudden "jump" at the heart, "as though it were coming into my mouth," and to this succeed a peculiar feeling in the finger-tips, which seem "oily and smooth," icy coldness (even the inspired air seems somehow for the time colder than usual), giddiness, pallor, trembling, and inability to speak. As the attack finishes an overpowering "nightmare" of depression seizes him, making him feel frankly suicidal. Every hour (for hours at a time), when the serial fits develop, he voids clear watery urine in quantity.

Especially worthy of note is the fact that in this case the "turns," which have continued for some twelve years, were at first invariably heralded by an unpleasant, "rotten" taste in the mouth, bringing with it a strong feeling of familiarity ("I have tasted this somewhere before"), and a peculiar dreamy sensation (in itself not unpleasant) "exactly as if I were going under gas." For the last two years, however, this uncinate aura has not recurred. To the student of the subject its association with periventricular epilepsy must appear highly informative, for in the first place the fact that a "visceral" or "affective" attack follows stamps the latter with the epileptic seal and justifies its acceptance as an epileptic variant; and, in the second, the radiation from temporo-sphenoidal to ventricular locus exemplifies an unusual line taken by physiological excitation or release, and suggests the possibility of still others.

Another instructive association is illustrated by the next case.

Mrs. B., aged 59, exhibits an old left juvenile cerebral hemiplegia, dating from the age of 12. For the last year she has suffered almost daily from attacks which commence with a sensation of "something moving or fluttering in the stomach"; this "something" passes up the body into the left arm, where it becomes a "burning crawling feeling," "as if my arm were being gripped round with red-hot wires"; the sensation extends to the tips of the left fingers, and is described as if "something stinging were trying to get out through the skin." At the same time palpitation starts, linked to a vague fear of impending evil; the patient feels sick and giddy, shivers all over ("I can't keep a nerve still"), and perspires clammily, but solely in the left upper limb, arm, and hand, never on the right. Immediately after the fit she passes a large amount of clear urine every half-hour for usually three or four times.

The interest of this case consists mainly in the peculiar connexion of visceral and somatic sensory auras; the initial vagal aura (stomach and heart) radiates over to a cortical sensory area—presumably a *locus minoris resistentiae*—whence in consciousness is experienced a definite Jacksonian sensory aura confined to the affected left arm. The fact of the sweating being restricted to that somatically involved limb is equally noteworthy. Within the neuraxis impulses can spread by unexpected and unsuspected routes in particular circumstances. Several clinical examples of the association of migraine, for instance, which is not supposed to be of periventricular origin, with these visceral attacks have come under observation, and one may be cited.

D. B., female, aged 35, unmarried, has suffered from sick headaches for years. These take a more or less classical form, with persistent vomiting, visual phenomena (not, however, teichopsic), unbearable headache, tenderness of scalp, photophobia, etc. They last usually for forty-eight hours. In the course of the migraine (which is always preceded by a day or two of pronounced physical and mental eutonia) the patient's hands and feet become icy cold and the head hot; palpitation and anxiety develop, and a mild degree of sweating. At this stage she invariably keeps passing water at short intervals, up to as many as twelve times in succession.

Though just an episodic syndrome, an epiphenomenon of the migraine, its interest resides in the linking together of cerebral centres by paths not commonly open to traverse.

Finally, in this connexion, I must allude to a recent case which illustrates still another of these combinations, and that along distinctly unusual lines.

C. C., male, aged 23, unmarried, has suffered from peculiar attacks for six years, at irregular intervals. They commence by a sensation at the heart ("as if it were moving round in a circle" to the accompaniment of "painful pricks") and in the stomach (the organ seems to "turn right over"); and the usual sequence of giddiness, shaking, hot waves, etc., is experienced in rather severe degree. Thereafter the patient feels extremely sleepy, and sometimes actually falls fast asleep. He has often observed that the fits are brought on by unrestrained laughter, and sometimes, too, by his being tickled; at such a moment he is suddenly seized by the pain at the heart, and the syndrome forthwith unrolls itself.

To my mind the case is deeply significant; no similar instance of the provocation of the vaso-vagal fit by the emotion which causes laughter has hitherto come under my notice. Clearly it furnishes a link on the one hand with narcoleptic semeiology, in the association of laughing and sleep; but while there is no evidence of cataplexy on the other, yet the production of a periventricular fit by a stimulus which in other circumstances gives rise to the cataplectic attack undoubtedly narrows the gap between narcolepsy and epilepsy. I have seen two cases of epilepsy in which the aura was one of motiveless and compulsive laughter, and there are instances on record of epileptic fits having been induced by that act, itself resulting from tickling the soles of the feet (Féré[43] quotes those of van Swieten, Esquirol, and Reynolds). Since in by far the greater number of cases of vaso-vagal fits the manifestations are attended by a feeling of apprehension, anxiety, or even of terror, it is curious to observe their origination in an emotion of a pleasurable kind. The mechanisms "let go" by the act of laughter deserve physiological study; its visceral concomitants include dilatation of capillaries (the skin reddens and glows); glandular secretion (the eyes sparkle; we laugh "till we cry"); vulgarly, also, we laugh until sphincter relaxation is imminent. We nearly "die of laughing"; we are "tickled to death." Is this seeming clinical novelty, then, akin to the last of these? The patient laughs or is tickled into laughter, till suddenly affected by a paralysing disorder of his cardiac

and respiratory mechanisms. I confess I find his case of peculiar scientific interest, but am content at present to sketch it in outline.

2. Less definite in constituent features, but equally suggestive of periventricular dysfunction, are cases distinguished, *inter alia*, by yawning. One may be taken from a previous communication[12] by way of example.

C. L., male, aged 25, has had peculiar fits for about one year, recurring on an average at fortnightly intervals. They are constituted by continual yawning, with constant voiding of urine, and are followed by violent giddiness, headache, and occasional vomiting. A family history of epilepsy has been obtained, but no organic signs have been seen on repeated examination.

One may perhaps hazard the speculation that these phenomena represent some disorder of periventricular visceral centres concerned in the regulation of sleep and of fluid interchange, with radiation to other visceral centres situated in the floor of the fourth ventricle.

3. Another rather unusual but interesting visceral association is provided by those cases of ordinary epilepsy which appear to have as a regular accompaniment *rise of temperature*. I do not here refer to the fever which develops when repeated severe general fits occur, as in status epilepticus, but to individual attacks, separated it may be by long intervals, in which elevation of temperature is found. Doubtless some such cases are simply explained by the temporary occurrence of some intestinal toxaemia accountable for both the fit and the fever, yet in other instances the question arises whether the latter may not be of neural origin. I have in mind the case of a schoolboy of 16, who for two years had had an occasional epileptic fit; in each instance associated with muscular effort (wrestling, swimming, running, and in the gymnasium), the attack consists of brief loss of consciousness, pallor, and involuntary micturition, without any convulsive movements (tonic or clonic) being in evidence. On each occasion the temperature has shot up after the attack to 103° or 104° F., coming down the same day, or the next, as suddenly as it has run up. No ready explanation for this occurrence has been discovered, even with the most careful search over the somatic systems. At the most, a severe generalized fit will not raise body heat more than half a degree. For the above and one or two somewhat similar instances it seems conceivable that a neural (neuro-sympathetic) mechanism is implicated.

4. When the semeiology of still other epileptic varieties is carefully scrutinized the fact that they appear to consist of little else than *isolated neuro-sympathetic disturbance* must be allowed. The remark is clearly apposite in respect of many examples of petit mal, so-called. Cases which the clinician has great difficulty in classifying, the choice lying between "faint" and "fit," belong here. Syncopal attacks are in essence visceral, and often indistinguishable from forms of fit; if of circulatory etiology they are considered "faints"; if of neural, they are "fits." But here, too, we may be labouring a distinction without a difference. An elderly gentleman has suffered from rare major epileptic fits for many years; since he has become slightly arterio-sclerotic they have ceased, but what he calls "sensations" have taken their place. These recur nearly every day. He was seated in my consulting room and my blood pressure instrument was on his left arm; asked a question about his old school, to my surprise he vouchsafed no reply; grasping the table with his left hand, and the arm of the chair with his right, he sat motionless, turned a greyish colour, and his respiration immediately accelerated in a rapidly rising series of ever shorter and quicker breaths, becoming slower again in about half a minute and the arrhythmia ending with a deep sigh. He immediately remarked, "Oh, I was at such and such a school," naming it as though he had not been aware of the seconds that had thus passed. Petit mal, of course, is merely a descriptive epithet; but, neurally considered, the symptom-complex in the case was surely limited to the visceral ganglia of the floor of the fourth ventricle, a disturbance there (whether vascular or neural I know not) bringing in its train that transient clouding of consciousness known as an "absence épileptique." Isolated escape of this and analogous kinds represents on occasion all that there is of epileptic semeiology.

If we could but discover the secret of inhibition and of de-inhibition, if we had some scientific means of reinforcing the former at the moment when escape from control is imminent, could we but determine that switching off of the current which in some patients can be effected by potent stimuli aroused through other channels at the crucial moment, our treatment of epileptic episodes would not be so nugatory as it often proves to be.

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STREPTOCOCCAL SEPTICAEMIA AND APLASTIC ANAEMIA.

CASE REPORT.

BY

D. A. ABERNETHY, M.B.OXON., F.R.C.S.ED.,
A. G. GIBSON, M.D., F.R.C.P.,
AND
A. WATSON RUSSELL, *M.C.*, M.B., CH.B.

THE patient whose case we record was a girl aged 18; she had never been robust, though she had enjoyed moderately good health. The tonsils had been under suspicion owing to a tendency to sore throat. On the evening of November 13th, 1929, there occurred pain over the left costal margin. The temperature was 104°. This kept up and was of the high remittent type when seen by two of us (A. W. R. and A. G. G.) on November 16th. Nose bleeding and ulceration of both tonsils had occurred on the 15th. She was a well-made girl, well nourished, coughing up blood, which apparently came from the nose. She was not unduly anaemic. The left cheek had a slightly bluish tinge. The pulse was 118, respirations 20; the fingers were not clubbed; the skin was normal in texture and clear of blemish or petechiae; there were no glands to be felt in the neck, axillae, or groins. In the chest there was a slight diminution of breath sounds towards the left base behind, but no interference with movement and no signs of fluid. There was nothing definite on examination of the abdomen. On November 19th the urine contained albumin, blood, and a few casts, with a moderate number of long streptococci. The signs in the left side of the chest were unaltered, but the left lumbar region was tender, and, though it was difficult to feel, the kidney appeared to be enlarged. The epistaxis continued until November 21st, and the albumin in the urine persisted.

On November 25th the temperature was of the high remittent type at the 102° level, and the patient was markedly anaemic. The sclerotics were greenish, as was the tint of the skin. The left lumbar and hypogastric region was tender, and one small petechial haemorrhage was noticed under the left breast. There were no signs of infective endocarditis nor of severe renal disease, and the blood in the urine had disappeared, leaving a trace of albumin only. The fever persisted; she became extremely ill with low muttering delirium at times, restlessness, and a return of the epistaxis on November 27th and 30th. She was treated by iron (Blaud's pill) and antistreptococcal serum (seven injections each of 10 c.cm., four of which were concentrated serums) on every second day and adrenaline chloride 10m daily. On December 5th she was given a

transfusion of blood, 1½ pints, which she stood well, though she had a rigor afterwards. She vomited on this and the previous day.

The progress, despite the transfusion, was downward, and on December 10th towards the evening the patient was breathless, anxious, restless, and in the early stages of cardiac failure. Adrenaline, which had been given in doses of 10 minims daily since November 27th, subcutaneously, was injected every three hours, and Fraisse's ferruginous ampoule 1 c.cm. was given intramuscularly; the following day the patient was slightly better, though she vomited three times and could not retain enemata of glucose with brandy. It was then noticed that she had a number of petechial haemorrhages over the chest. Some days before this, on December 4th, the right lobe of t! thyroid had become enlarged and was slightly painful, but the gland was well defined at this spot and showed no infiltration nor any external signs of haemorrhage. On the morning of December 12th her condition was extremely critical. She was semiconscious and restless, the respirations were rapid, and she complained of cramp-like pains in the legs. There was a large ecchymosis under the skin of each heel, surrounded by a flushed area, which looked like incipient gangrene, and there were areas of anaesthesia over the shins. As the patient appeared to be dying of anoxaemia a second transfusion was given of 1½ pints of Group II blood.

The result of this transfusion was a striking improvement, for the following day she had a boiled egg for her breakfast and enjoyed fish for dinner, whereas the previous day (December 11th) she could retain nothing given by the mouth and very little given per rectum. The temperature following this transfusion did not rise above 100° and fell to normal by December 27th.

On December 24th the thyroidal swelling, which had become general and harder, pointed on the right side, and a fair quantity of pus containing streptococci was evacuated under gas. The wound gradually healed under treatment by fomentation.

After the second transfusion her colour became natural, though her general aspect was anaemic. From this time on she was given adrenaline and iron, and made progress. Rheumatic pains affecting both feet were present in the early days of January. On January 7th there was nausea, and on the 8th it persisted and the patient became drowsy. Pain appeared in the left loin on January 10th, and continued with rheumatic pains in the leg and knee for several days. Nausea also persisted. Fever again became evident on January 8th. There was tenderness in the left loin, and the left kidney was suspected of causing this tenderness. On January 9th the urine contained a trace of albumin; in the deposit were pus cells and others from a transitional membrane, together with some long-chain streptococci. On January 21st the urine contained albumose as well as a slight amount of albumin. Pain on that day had appeared in the left knee. On January 24th she had a bout of pain in the loin, called for the bedpan, and after what appeared to be a spasm passed two small masses of membrane, yellowish in colour, one 2 inches long and 1/3 inch broad, the other elongated, with striations on the surface 1/2 inch by 1/2 inch by 1/8 inch. The membrane had the ordinary structure of a pyogenic membrane and contained numerous streptococci; the urine following this attack contained pus. The temperature fell to normal on the next day (January 25th), and the pain ceased. Frequency of micturition was marked on the 25th and 26th, and the appetite returned on the 27th. From that date she made good improvement; the pus and albumin in the urine persisted for nearly a fortnight, but all signs of abnormality, including albumose, had disappeared by February 20th.

The Blood Condition.

The following are the blood counts made at different stages throughout the illness.

				Total No. per c.mm.
November 26th, 1929.				
Red blood cells 1,450,000	Polymorphs	... 17%	.....	909
Haemoglobin 24 per cent.	S. lymphocytes	... 34%	.....	1819
Colour index 0.85	L. lymphocytes	... 49%	.....	2621
White blood cells 5,350				

				Total No. per c.mm.
December 5th.				
Red blood cells 850,000	Polymorphs	... 20%	.....	208
Haemoglobin 18 per cent.	Lymphocytes	... 58%	.....	603
Colour index 1.1	Endothelials	... 17%	.....	176
White blood cells 1,040	Mast cells	... 5%		

Blood platelets very few. Nucleated reds present. Moderate degree of anisocytosis. No gross poikilocytosis or polychromasia. Size of red cells 7.32 microns (Eve).

December 5th, blood transfusion.

December 10th.				
Red blood cells 1,170,000	Polymorphs	... 30%	.....	450
Haemoglobin 24 per cent.	Lymphocytes	... 52%	.....	780
Colour index 1.09	Endothelials	... 11%	.....	165
White blood cells 1,500	Mast cells	... 4%		
	Eosinophils	... 1%		
	Myelocytes	... 2%		

Four nucleated red cells seen. There was little alteration in shape and none in colour of the red cells. Platelets were extremely rare.

December 12th, second transfusion.

December 16th.				
Red blood cells 1,330,000	Polymorphs	... 29%	.....	490
Haemoglobin 30 per cent.	Lymphocytes	... 63%	.....	787
Colour index 1.1	Endothelials	... 7%		
White blood cells 1,250	Mast cells	... 1%		

Size of red cells 7.4 microns. Slight polychromasia. Two nucleated reds per 100 white cells.

December 23rd.				
Red blood cells 1,640,000	Polymorphs	... 36%	.....	590
Haemoglobin 32 per cent.	Lymphocytes	... 57%	.....	934
Colour index 1.0	Endothelials	... 6%		
White blood cells 1,640	Mast cells	... 1%		

Anisocytosis and poikilocytosis moderate. No polychromasia or punctate basophilia seen. Platelets present in small numbers. One normoblast seen.

December 30th.				
Red blood cells 1,900,000	Polymorphs	... 52%	.....	962
Haemoglobin 40 per cent.	Lymphocytes	... 41%	.....	758
Colour index 1.0	Endothelials	... 6%		
White blood cells 1,850	Mast cells	... 1%		

Slight polychromasia and anisocytosis. Red cells 7.8 microns.

January 5th, 1930.				
Red blood cells 2,060,000	Polymorphs	... 35%	.....	997
Haemoglobin 54 per cent.	Lymphocytes	... 50%	.....	1425
Colour index 1.3	Endothelials	... 14%	.....	798
White blood cells 2,850	Eosinophils	... 1%		

Size of red cells 7.7 microns. Anisocytosis but no poikilocytosis or polychromasia. Platelets very few.

January 13th.				
Red blood cells 2,250,000	Polymorphs	... 68.5%	.....	2733
Haemoglobin 50 per cent.	Lymphocytes	... 25.5%	.....	1359
Colour index 1.1	Endothelials	... 5.0%		
White blood cells 5,450	Mast cells	... 0.5%		
	Myelocytes	... 0.5%		

Size of red cells 8.30 microns. Morphology normal.

January 20th.				
Red blood cells 2,620,000	Polymorphs	... 47%	.....	2209
Haemoglobin 52 per cent.	Lymphocytes	... 31%	.....	1457
Colour index 1.0	Endothelials	... 21%	.....	987
White blood cells 4,700	Eosinophils	... 1%		

Size of red cells 7.64 microns.

January 27th.				
Red blood cells 2,240,000	Polymorphs	... 52%		
Haemoglobin 50 per cent.	Lymphocytes	... 44%		
Colour index 1.1	Endothelials	... 4%		
White blood cells 5,200				

Size of red cells 7.64 microns. Some poikilocytosis and anisocytosis.

February 3rd.				
Red blood cells 2,960,000	Polymorphs	... 44%	.....	2134
Haemoglobin 54 per cent.	Lymphocytes	... 45%	.....	2182
Colour index 1.2	Endothelials	... 9%		
White blood cells 4,850	Eosinophils	... 1%		
	Mast cells	... 1%		

Size of red cells, 7.64 microns. Some poikilocytosis and anisocytosis.

February 10th,				
Red blood cells 2,960,000	Polymorphs	... 28%	.....	1232
Haemoglobin 56 per cent.	Lymphocytes	... 61%	.....	2684
Colour index 0.94	Endothelials	... 8%		
White blood cells 4,400	Eosinophils	... 2%		
	Mast cells	... 1%		

Size of red cells, 7.64 microns. Slight degree of anisocytosis and poikilocytosis.

February 17th.				
Red blood cells 2,680,000	Polymorphs	... 47%	.....	2115
Haemoglobin 60 per cent.	Lymphocytes	... 44%	.....	1980
Colour index 1.1	Endothelials	... 9%		
White blood cells 4,500				

Size of red cells 7.64 microns. Still slight anisocytosis and polychromasia.

				Total No. per c.mm.
February 24th.				
Red blood cells 3,240,000	Polymorphs	...	16%	 296
Haemoglobin 68 per cent.	Lymphocytes	...	66%	 1221
Colour index 1.0	Endothelials	...	16%	 296
White blood cells 1,850	Eosinophils	...	1%	
	Mast cells	...	1%	

Size of red cells, 7.81 microns.

March 3rd.				
Red blood cells 3,910,000	Polymorphs	...	12%	 264
Haemoglobin 72 per cent.	Lymphocytes	...	80%	 1760
Colour index 0.92	Endothelials	...	8%	
White blood cells 2,200				

Red cells almost normal in appearance and by Eve's halometer 7.48 microns (normal).

It will be seen that throughout there was a very grave anaemia with a high colour index, reaching on January 5th the figure 1.3. The white count in the most serious part of the illness was very low, and the total polymorph count extremely so. The size of the red cells was never enlarged as determined by Eve's halometer, except on one occasion (January 13th), when it was increased and in the pernicious zone. The whole gives a picture of serious interference with the bone marrow, but with some evidence of activity of that tissue. The interpretation of these counts is that the patient suffered from an aplastic type of anaemia (agranulocytic anaemia). The last blood count, though the patient was apparently convalescent, showed a moderate degree of anaemia of this type.

The Cardio-vascular System.

The pulse from the early stage of the illness was fast, and was seldom recorded below 100. When the anaemia was most marked in the early days of December it varied about 120. It appeared to be higher after the first transfusion. On December 11th the pulse was recorded up to 152; on this day the patient appeared to be dying; she was extremely pale, was breathless (respirations 48), and orthopnoeic. Injections of adrenaline chloride 1/1000 of 0.5 c.cm. at three-hourly intervals caused great relief to the breathing and a lowering of the pulse rate. Subsequent to this the injections were repeated thrice daily until December 30th, when they were reduced to two a day. It was reduced to once a day on January 7th and discontinued on February 7th.

Remarks.

The case in one aspect was one of streptococcal septicaemia. The illness began with a sore throat. Fever persisted altogether in the first instance for twenty-nine days at a high level. Though no blood culture was made streptococci were identified as the causal agent of the renal haemorrhage on November 19th. Streptococci were the cause of the thyroidal abscess which was opened on December 24th; the same organism was found in the sloughs passed in the urine on January 24th. The damage so obvious in the kidney and the thyroid appeared also in the bone marrow, as shown by the nature of the anaemia, the rheumatic pains, and the presence of albumose in the urine.

In the matter of therapy only the most important drugs and measures are mentioned. The first blood transfusion appeared to have some effect, but the second following the increased dose of adrenaline appeared to act in a marvellous way. The action of the adrenaline appeared to serve more as a cardiac stimulant than as a haemopoietic, such as appears to be so clear in a previously published case.[1]

As convalescence was established the patient returned to her home and ceased to be under our observation. The blood count, it will be seen, was not normal, and as the patient is young there is room for hope that some, if not complete, restoration of function of the bone marrow may ultimately ensue. It may be mentioned, however, that the patient in the case previously described by one of us[1] still retains the blood count of an aplastic anaemia.

Since the above was written the patient, after leading a normal life again, suffered from a severe tonsillitis and died after a short illness.

REFERENCE.

[1] Gibson, A. G.: *Lancet*, 1926, ii, 948.

THE DIRECT COMPARATIVE DIFFRACTION METHOD OF DEMONSTRATING MEGALOCYTOSIS.

BY

J. H. MALLOY, M.B., CH.B.,

CHEADLE, STAFFORDSHIRE.

Two noteworthy articles by Pijper[1] and Eve[2] appeared in the literature of the past year describing instruments for the practical application of the diffraction phenomenon to the diagnosis of pernicious anaemia. Both instruments show advance in the direction of simplification of necessary apparatus for convenience in clinical use. Edwards[3] has described a modification of Pijper's instrument with a simpler form of illumination.

The "direct comparative diffraction" method is a further simplification. Exhaustive examination of blood films fails to show that it sacrifices efficiency for simplicity. For the practical diagnosis and control of the treatment of pernicious anaemia, I have found that the results compare advantageously with those obtained by either Eve's halometer or Edwards's modification of Pijper's "diffraction micrometer." My personal observations have been controlled and verified by the untutored observation and discrimination of a large number of individuals of varying intelligence, who merely described what they saw in complete ignorance of the significance of their findings.

The only *essential* apparatus is a normal blood film with which to compare films taken from cases suspected of suffering from the disease. Any source of artificial light may be used, but candle light is probably best on account of its softness. The flame of any small cigarette lighter with an exposed wick gives excellent results and is easily carried.

Principle of the Method.

The method depends on the following facts. If a light is observed through a blood film held close to the eye a diffraction halo is seen which varies in intensity with the thickness of the film and the size, quality, and distance of the light. The halo consists of two zones, the inner of which is a yellow disc surrounded by an orange ring. The outer zone consists of concentric coloured circles of red, orange, yellow, green, blue, indigo, and violet, from without inwards. Interposed between the two zones and actually belonging to the inner one is a red ring, which mingles to a varying degree with the orange and violet. For the test this red ring is taken as the dividing line between the two zones.

If the light is observed through two blood films, one in front of each eye like spectacle lenses, actually only one halo is seen. In reality it consists of the superimposed haloes of the two films. The production of diplopia separates the haloes and presents them side by side for comparison as to size. The haloes for the corresponding films are on the same side as the films. The diplopia can be produced by a voluntary internal squint or by placing a prism, such as is found in refraction test cases, in front of one eye with the base to the inner side.

The inner zone is the one chosen for comparison. By comparison with the halometer and modified micrometer I have found that the central disc varies in size inversely with the average size of the red blood corpuscles. It is possible to note variations of 0.1 degree according to Eve's scale. The greater the degree of megalocytosis the more accurate is the discrimination. Comparatively speaking, the difference in the size of the haloes which would give readings of 4.7 and 4.1 degrees respectively by Eve's scale might be taken as the difference between a halfpenny and a sixpenny piece; 4.3 and 4.1 degrees as the difference between a florin and a halfpenny.

Making of Films.

Wash the slides with soap and water, rinse thoroughly, dry with a towel and polish with a piece of silk. To obtain a drop of blood, pierce the lobe of the ear, which need not be sterilized, with a sterile medium-sized surgical needle. Squeezing the lobe does not affect the test. Take the drop on one end of the slide, allow it to spread along

the edge of another slide, and with the latter push it rapidly towards the other end. This gives a film which tapers off in thickness, a condition ideal for the test.

To obtain a standard film take drops of blood from several known healthy persons and compare the size of the central zones of their diffraction haloes. If no difference in size can be noticed between any of them, any one may be taken as standard.

Technique of Test.

Hold the standard film between the finger and thumb of one hand and the unknown film in the other. Examine the source of light through both separately to find the spot where the halo is seen most clearly. Having done this, hold both films close to the eyes with the upper ends of the slides resting against the eyebrows. Produce diplopia, and compare the size of the central discs of the separated haloes. If a prism is used, fix it to the front of the slide with the finger and thumb, with the base inwards, and examine by the method I have described. Make sure first that the prism will produce diplopia. Whatever method is used the observations should be checked by transposing the slides.

Two fallacies may arise which are easily avoided provided the possibility of their existence is recognized. They only cause confusion when examining slides whose corresponding haloes are practically equal. Prolonged gazing at a bright light may cause a variation in the size of the haloes from irritation of the retina. It may even be found that the smaller halo remains on the same side when the slides are transposed. The remedy is to use a soft light and to carry out the examination as expeditiously as is compatible with accuracy. The soft light of a candle is best, and I always use it in finally deciding doubtful cases.

If the voluntary internal squint is used, too long continuance of it may result in changes in the size of the haloes. This is due to unequal spasm of accommodation, and is most likely to occur if the light is brilliant and the operator unpractised. Only those who can produce diplopia readily should use the squint method. To correct the error rest the eyes for a few moments and examine the film again. If in doubt use candle-light.

Value of the Test.

According to the observations of Price-Jones and Hurst an increase in the size of the red blood corpuscles is a constant feature of pernicious anaemia. The "direct comparative diffraction" method shows this change, if present, by allowing of the comparison of unknown blood films with normal blood films. The accuracy of the test depends on the finding of A. Pijper that the diffraction halo produced by passing a beam of light through a blood film varies in size inversely with the average diameter of the red blood corpuscles.

Application of the Method.

The presence of symptoms suggestive of pernicious anaemia and spinal cord degeneration calls for its use, as also do the symptoms classified under pre-pernicious anaemia described by Eve. Marked positive results are diagnostic. Negative results accompanied by strongly suggestive symptoms of "pre-pernicious anaemia" must be followed by very thorough physical examination, including a test meal for achlorhydria, examination of stools for occult blood, ova, etc. Failure to follow this last rule suggests a compromise between a desire for early diagnosis and a disinclination to follow the desire to a logical conclusion.

Prophylaxis.

The inclusion of "pre-pernicious anaemia"[2] with pernicious anaemia under the heading of "megalocytic anaemia" appears to me confusing. Pre-pernicious anaemia by its very definition is not accompanied by anaemia. Also from the point of view of the pathogenesis of the condition the term as applied by Eve is misleading. Hurst[4] has shown that the primary condition is achlorhydria, which allows of infection of the duodenum by a haemolytic streptococcus. This appears to be the starting point from which the toxin is produced. Absorption of this toxin eventually results in the changes in the body which are recognized as pernicious anaemia. It would seem to be more helpful to call the interval between infection and the onset of anaemia the incubation period of pernicious anaemia.

If this view is taken the scope of prophylaxis is extended. A negative result of examination for megalocytosis, if accompanied by achlorhydria, should be followed by removal of all septic foci and treatment by hydrochloric acid. The patient should be told of the possibilities of the condition and instructed to attend every month for blood examination. I am at present treating a patient on these lines with very satisfactory results. I have impressed on her the importance of seeking advice immediately on the reappearance of symptoms. If megalocytosis is found, liver treatment must be given.

Control of Treatment.

Once treatment has been commenced this method may be used as a check on any improvement. Blood films should be taken every fortnight and marked with name and date. Each new blood film should be compared with the standard and as many of the previous films as are necessary to check whether the condition is stationary, improving, or retrogressing. The slides can be safely kept between succeeding folds of white paper.

Comparison with Other Methods.

The disadvantages of this method are more numerous in theory than they are real in actual practice. It might be argued that slight differences in the average diameter of the red blood corpuscles—say 0.05 μ—would not produce differences in the size of the haloes easily discernible to the eye. Even if this is literally true, it by no means diminishes the value of the method. On the contrary, it enhances it because the absence of a sharp dividing line between normocytosis and megalocytosis renders such delicate differentiations valueless and misleading in diagnosis.

With regard to delicacy of differentiation in the observation of any increase or decrease in the size of the corpuscles it compares very favourably with Eve's halometer. I have not found that different observers, even with practice, get constant results with the same slides in the use of this instrument. This is due to the fact that as the haloes are approximated the arcs in the red circle cut off by the green circles of the overlapping outer zones become more and more indistinct, making the points of contact, to say the least, arbitrary. This is easily made out by pushing the knob along the slide till the red circles are almost in contact and comparing the clearness of the red at the inner and outer poles.

The modification of Pijper's diffraction micrometer described by Edwards is open to several objections. Very slight faults in construction—for example, errors in alignment of the partition—give erroneous results. The flash-lamp bulbs which may be used for the light may give distorted haloes, so much do they vary in their filaments and in the shape of their glass bulbs. Slight variations in the focusing of the lenses may result in the formation of incomplete semicircles which are useless for differentiation. Films which can easily be differentiated by the "direct comparative diffraction" method, may give results with this instrument the interpretation of which is largely open to questions of opinion.

The method I have described possesses the following advantages. The necessary impedimenta are easily carried. They consist of three glass slides, one with a standard blood film; one glass prism, unnecessary if the user can produce voluntary diplopia easily; one small pocket cigarette lighter, also unnecessary as the candle is ubiquitous; one medium-sized surgical needle; a small piece of cotton-wool to stop bleeding if necessary. All these can be carried in a small cigarette case. Mechanical breakdown is impossible. There are none of the difficulties which are constantly associated with electric lighting.

If it is remembered that (1) variations in size of the haloes which might be considered equivocal constitute a negative result, (2) equivocal observations must be followed by a test meal if the suspicions of pernicious anaemia in any of its stages are strong, this method has nothing to lose by comparison with instrumental methods of measuring megalocytosis.

Conclusion.

Since no fixed boundary line can be determined between normal and abnormal size of the red blood corpuscles for any given individual, I think that the regular comparison of blood films in suspicious cases of pernicious anaemia is of much greater value than attempting to fix a definite point judged by any scale on any instrument. Therefore I submit as worthy of consideration the value of the "direct comparative diffraction" method of observing the onset and progress of any increase in the size of the red blood corpuscles, which has been shown to be diagnostic of pernicious anaemia and the blood changes of subacute combined degeneration of the spinal cord.

REFERENCES.

[1] *British Medical Journal*, April 6th, 1929, p. 635. [2] Ibid., July 12th, 1929, p. 48. [3] Ibid., October 26th, 1929, p. 785. [4] Price's *Textbook of the Practice of Medicine.*

MEASUREMENT OF THE DISTRIBUTION OF GAMMA RAYS AROUND A FOUR-GRAM MASS OF RADIUM.

REPORT FROM THE PHYSICS DEPARTMENT, WESTMINSTER HOSPITAL,

BY

H. T. FLINT, D.Sc., PH.D., M.R.C.S., L.R.C.P.,

AND

L. G. GRIMMETT, B.Sc.

THIS paper describes an attempt to measure accurately the gamma radiation field, in air, of the radium "bomb" in use at Westminster Hospital Annexe. The bomb is shown, in section only, in Fig. 3; four separate grams of radium were placed one at each corner of a 4 inch horizontal square, and so disposed in a lead container* that the issuing radiation was confined to two fairly narrow beams, one above and the other below the container.

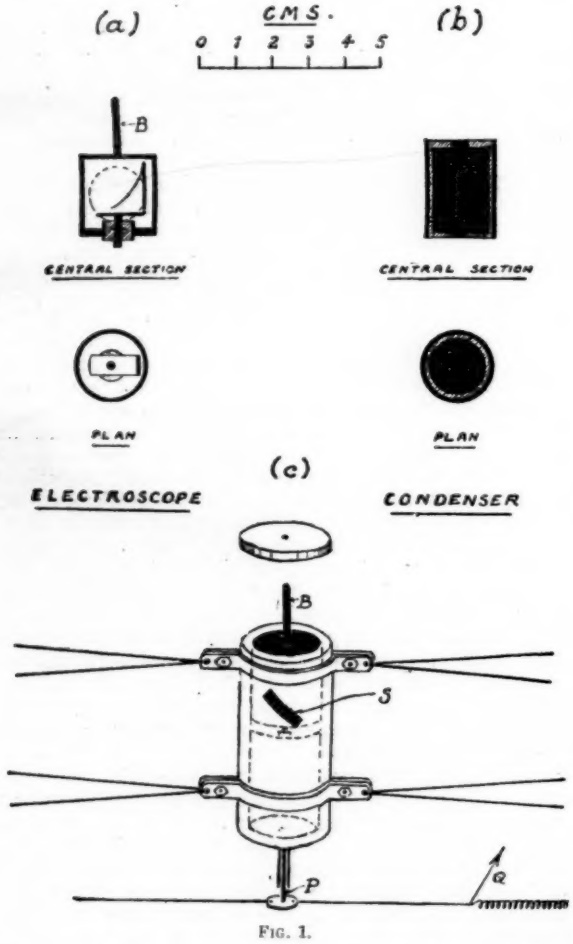


FIG. 1.

An ionization method was chosen for investigating the field. A few preliminary trials with the usual type of apparatus—namely, a small exploring ionization chamber connected by a long wire to a distant electroscope—led us to believe that many difficulties would be avoided at the outset by combining ionization chamber and electroscope into one small instrument, thereby dispensing with connecting leads altogether. It is, for example, impracticable to use lead screening to prevent ionization losses from the connecting wire on account of the thickness required; the alternative plan of embedding the wire in paraffin wax gives trouble from the static charging-up of the insulation immediately round the wire when exposed to the radiations. The capacity of such a connexion also becomes undesirably large compared with that of the ionization chamber.

Accordingly, a tiny gold leaf electroscope was made up as shown in Fig. 1 (*a*). The leaf was attached to a brass plate 15 by 6 mm., which was mounted on a sulphur plug, and encased by a thin brass cylinder of radius 10 mm. and length 20 mm., furnished with a transparent circular window back and front. To slow down the movements of the gold leaf to a measurable rate in the intense fields which were being dealt with it was found necessary to add in parallel with the electroscope a small condenser consisting of two co-axial brass cylinders separated by a thin film of sealing-wax (Fig. 1 (*b*)), whose electrostatic capacity was of the same order as that of the electroscope itself.

To ward off stray beta rays the electroscope and condenser were assembled one above the other in a cylindrical lead sheath 3 mm. thick (Fig. 1 (*c*)), which was closed by a circular disc of lead 3 mm. thick; this was located in position by the spike B fixed to the top of the electroscope; the spike also served to indicate the middle of the instrument. The only beta rays which could enter the ionization chamber directly were those which passed in through the narrow diagonal viewing slots S.

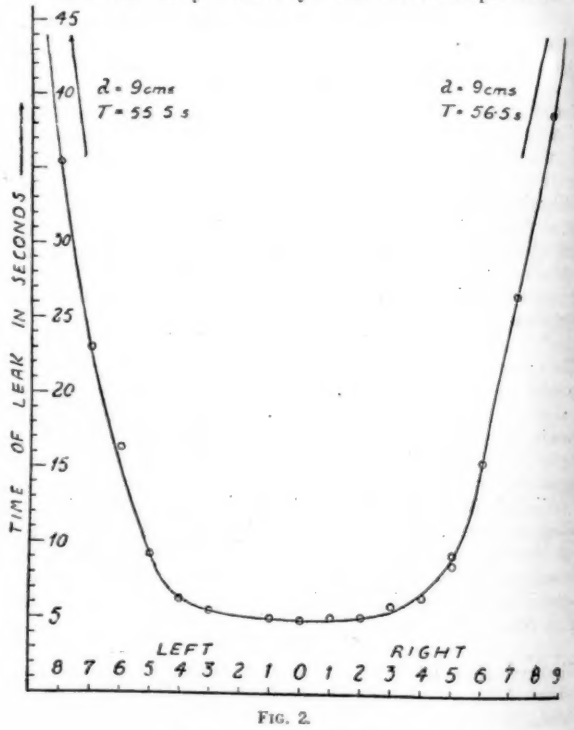


FIG. 2.

In order that scattered radiation from the electroscope supports might be reduced to a minimum, the lead sheath

* For a complete account of the bomb see an article on "Radium Teletherapy" by Francis Rock Carling, in the *British Medical Journal* of February 8th, 1930 (p. 232).

and contents were slung on thin steel wires at the centre of an opening 1 metre square, in a light wooden framework, braced with steel wires, which carried at one end a lamp for illuminating the leaf and at the other a telescope for viewing the leaf at a safe distance of 2 metres.

The radium container was too heavy to move about with ease, therefore wheels were fitted to the framework so that it would run on a horizontal rail at each end, each rail being adjustable for height. The electroscope could thus be placed in any desired part of the field and its position recorded by means of horizontal and vertical scales attached to the framework.

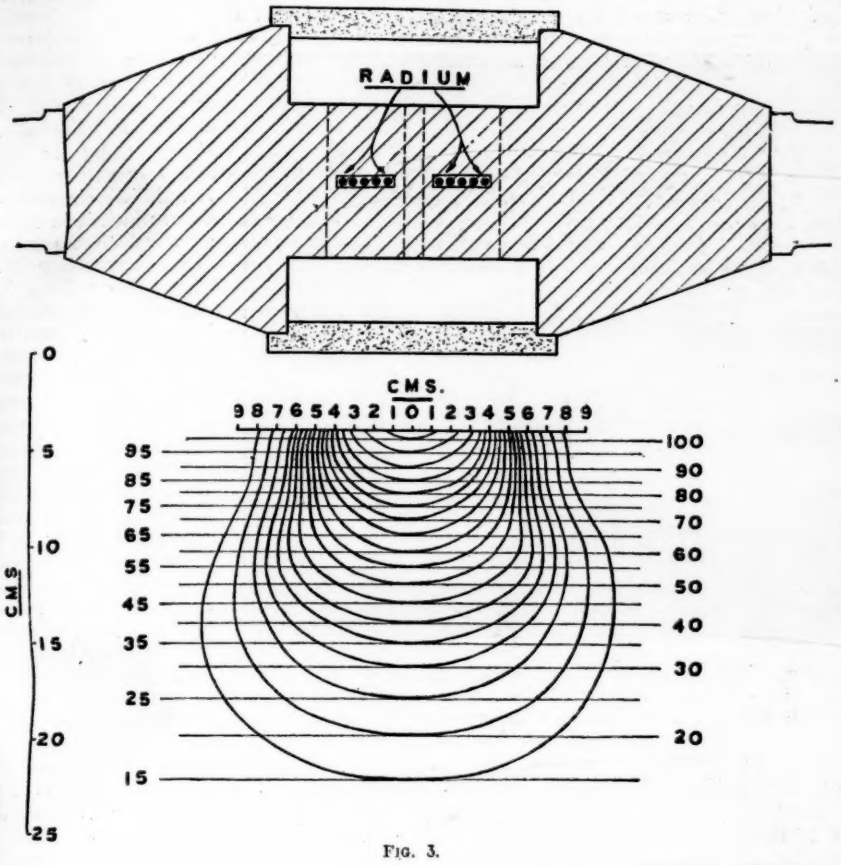


FIG. 3.

The gold leaf system could be connected to a battery of 230 volts by lifting the metal plunger P into contact with the condenser by pulling on a string Q at the operator's end. The plunger was earthed to the electroscope case during measurements.

The relative gamma-ray intensities at various points were determined by timing the fall of the gold leaf over a fixed interval in the eye-piece scale, which corresponded to a potential change in leaf and condenser of from 228 to 142 volts. The accompanying table gives a typical set of readings taken along a horizontal line 4 cm. below the bomb, and intersecting its vertical axis. Fig. 2 shows the same data in graphic form.

Distance (in cm.) to left of centre	9	8	7	6	5	4	3	1	0
Time of leak (seconds) ...	55.5	35.5	23.0	16.3	9.2	6.2	5.4	4.9	4.8
Distance (in cm.) to right of centre	1	2	3	4	5	6	7	8	9
Time of leak (seconds) ...	5.0	5.0	5.8	6.4	8.5	15.3	25.6	38.7	56.5

Further series of measurements were taken at different levels, in all about 500 readings, covering a vertical area 25 by 20 cm., each series giving a curve of the same general character as that of Fig. 2.

The strongest field observed, corresponding to a time of leak of 5 seconds, was taken as 100 in arbitrary units of intensity. The isometric lines (curves of equal times of leak, "isodoses") for 100, 95, 90, etc., arbitrary units were drawn by linking up the points on the various levels for which the times of leak were 5 sec., 5.26 sec., 5.55 sec., etc., these numbers being inversely proportional to 100, 95, 90, etc. Fig. 3 shows, on a reduced scale, the gamma-ray isometrics taken in a vertical diametral plane parallel to the bomb supports; it is accurate on the whole to within 5 per cent. The chart enables skin doses to be read off in arbitrary units.

At the present time there is no general agreement as to the best absolute unit to be used in connexion with the measurement of dosage in gamma-ray therapy. Various units have been employed in radiation therapy, and two of these which could be applied to this work are the international R unit and the absorption unit (energy absorbed per cubic centimetre per milligram hour). The calculation of the dose in terms of these units is not without difficulty, especially in the case of the R unit. The electrostatic capacity of our measuring instrument has been determined by direct substitution in an oscillating circuit, which completes the data required for computing the total charge set free per second in the ionization chamber, but in order to separate the wall effect from the true gas ionization effect by means of which the R unit is defined much further research is necessary.

The arbitrary units adopted here form the basis of an accurate measurement of the dose given in any case, and it will be possible to convert them to whatever scientific unit is ultimately adopted in work of this kind. The depth dose in the tissue may be expected to differ somewhat from that indicated on the chart by reason of scattering and absorption.

It is interesting to note in passing how clearly the lateral bulges of the isometrics mark the boundary of the geometrical shadow cast by the lead tunnels which confine the radium. Evidently the spreading of the field may be controlled by altering the depth of the lead channel.

LATEST MODIFICATION OF WESTMINSTER TELETHERAPY APPARATUS.

BY

FRANCIS ROCK CARLING, B.Sc.,

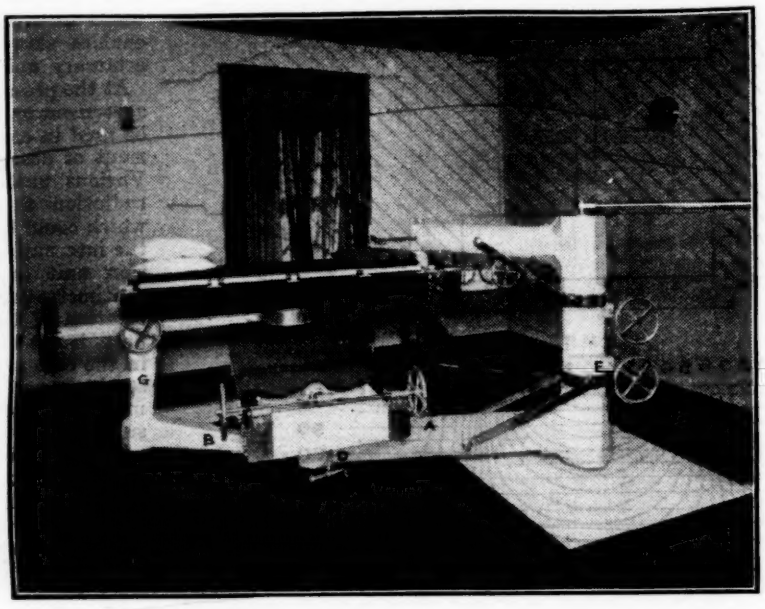
LATE TECHNICAL ADVISER, RADIUM DEPARTMENT, WESTMINSTER HOSPITAL.

THE apparatus to be described was designed to enable those engaged in the treatment of patients to perform their work more safely and easily.

Two patients can be treated simultaneously, one above the radium, the other beneath it. The bomb itself is designed to tilt only about one axis, so placed that the direct radiation cannot enter the main building, the directions being either towards the sky and ground, or the garden and the road, which are safe by reason of distance. Thus the necessity for protecting the main building is largely removed. In order, however, to err on the side of over-precaution, barium plaster was added to a 24-inch wall. Each stretcher can be so approached to the bomb that the axis of tilt of the latter is either parallel to the stretcher or at right angles to it. Each stretcher can also be raised or lowered, tilted about its long axis, and traversed longitudinally or laterally. Thus the radiation from the bomb can be brought to any position on a patient with the minimum of inconvenience. All the movements

can be accomplished with but slight physical effort. The controls are placed at the end of the stretcher, which is remote from the radium, so that the operator may adjust the patients, while himself being not only out of the field of radiation but at a considerable distance from it. In the same way the bomb controls are placed sufficiently far from the radium for adjustment to be effected without exposure to the radium.

It may be mentioned for the sake of those who are interested in technicalities of design that, in spite of the substantial appearance, the maximum stress normally occurring in the hollow wooden beams of the stretchers amounts to 500 lb. to the square inch in tension and 300 lb. in compression. The maximum normal stresses in the steelwork are 10,000 lb. to the square inch, in the non-corrosive aluminium castings 5,000 lb., and the maximum bronze-bearing pressures 1,000 lb. to the square inch. In the case of a suddenly applied load (patient) these stresses may be momentarily doubled.



The procedure in putting a patient into position is as follows. The appropriate stretcher is pushed round until it occupies a position near the door (in the photograph this is near the foreground). Here the patient is either lifted on to the stretcher or, if able, mounts into position by a convenient pair of steps. Then the patient is made comfortable and the exact situation of the lesion located. The stretcher is then pushed into the approximately correct position. The height is adjusted by the wheel A, the tilt by the wheel B. Longitudinal and lateral adjustment requires only a slight pressure of the hand to push the stretcher as desired. The position can then be fixed by adjusting the clamps D and E. The desired tilt of the bomb is effected by the wheel C. Once the patient is correctly adjusted the radium is moved from its shielded position into its working position by means of the lever F.

The bomb itself consists of a circular lead block some 17 inches in diameter and 5 inches in thickness. It is slung in an aluminium casting round its circumference, which is in turn attached to the steel beam supporting it. The beam rotates in ball bearings in the head of the stand G. In the centre of the lead is a hole passing through it some 8 inches in diameter. Into this from either side are screwed lead annuli of desired dimensions, so that an opening from 4 to 6 inches in diameter can be obtained. The radium, in 20 *tubes*, can be moved radially into this hole by means of a Bowden cable terminating in the handle F. Thus the tubes are always disposed in a circle, the diameter of which can be varied at will. An investigation of the field from this arrangement of radium is now in the process of being performed. The preceding article by Dr. Flint and Mr. Grimmett describes the field from the "bomb" illustrated in the *Journal* of February 8th, 1930.

FATAL DERMATITIS FOLLOWING THE USE OF IODINE SPIRIT SOLUTION.

BY

R. CHARLES ALEXANDER, M.B., CH.B., F.R.C.S.ED.,

SURGEON, ROYAL INFIRMARY, DUNDEE; LECTURER IN CLINICAL SURGERY, UNIVERSITY OF ST. ANDREWS.

For some twenty years solutions of iodine in spirit of varying strength up to 5 per cent. have been in use for the preparation of the skin preliminary to surgical operation. While a certain amount of skin irritation has been noted in a few cases, there would seem to be no record of a fatality occurring from the use of such a solution, and an account of the course of a case where death followed its use seems worthy of publication.

A married woman, aged 37, was admitted to my wards in Dundee Royal Infirmary, on the recommendation of Dr. G. F. Whyte, for the radical cure of a femoral hernia. There was nothing unusual in the clinical features of the case, or in the account given by the patient of her previous health. Fifteen years previously she had been operated on by another surgeon for acute appendicitis, but no information is available as to the method of skin preparation employed at that time.

The routine skin preparation then employed in my clinic was that on the day previous to operation the skin of the operation area was shaved; the part was washed with ethereal soap and water, dried with a sterile towel, painted with surgical spirit, and, when that had dried, it was painted with a 2½ per cent. solution of iodine in spirit. When this had dried the part was covered with a sterile dressing retained in place by a bandage, this preparatory dressing being removed on the operating table after anaesthesia had been induced, and just before the final preparation of the operation area, which, in a clean case, consisted of the application of a single coat of the 2½ per cent. iodine solution with a gauze pad held in forceps by the surgeon or assistant. The solution kept in the theatre for this purpose is stored in a coloured glass bottle with a glass stopper; sufficient for use in each case is poured into a sterile enamel dish, a fresh supply being employed for each patient, and no other iodine solution being kept in the theatre. At the conclusion of the operation the area is again painted with the solution; a sterile dressing of gauze and cotton-wool is applied and retained in place with a domette bandage.

The solution used is a 2½ per cent. solution of resublimed iodine in pure industrial alcohol. A small quantity of chloroform, in the proportion of one fluid drachm to four fluid ounces, is added to the iodine solution to prevent the evolution of the irritating iodine vapour so common to alcoholic solutions of iodine. Industrial alcohol (the industrial methylated spirits supplied for hospital and special pharmaceutical purposes) is a mixture of plain spirit with 5 per cent. of its volume of methyl alcohol, and is preferable to the mineralized spirit since it contains no pyridine or methyl violet, and less methyl alcohol.

In the case under review nothing unusual was observed in the appearance of the skin at the time of operation. The solution employed in the wards and in the theatre for the preparation of the patient was used in several other cases without untoward effects.

The first sign of anything being amiss was observed on the day following the operation, when the patient complained of an intense irritation in the region of the wound. On examination the whole area prepared for the operation was found covered with an erythema with a few pustular spots. A mild boric dressing was applied, and, since this failed to give relief, the application of 10 per cent. ichthyol in glycerin was tried. On the following day the temperature rose to 103°, the erythema being intense and almost plum-coloured, with white spots scattered over the whole area. The pulse rate was 140, and the heart was found to be slightly enlarged, with soft systolic bruits in all areas. There were no abnormal physical signs in the lungs or abdomen; urine was freely passed, and the bowels moved normally. There was

slight delirium. The white blood cell count was 12,800 per c.cm. On the third day after the operation delirium was well established, and the pulse became imperceptible. On the advice of Dr. F. M. Milne, dermatologist to the Infirmary, sodium thiosulphate in 5 per cent. aqueous solution was applied to the affected area, with the result that the erythema disappeared in a few hours. The patient died seventy-two hours after the operation with cardiac failure and delirium as the terminal features.

Since the certificate of death stated that the cause was "iodine poisoning," the case had to be reported to the Procurator Fiscal for inquiry. The authorities accepted our medical report as fully explaining the reason for the patient's death, and did not order a post-mortem examination, and, as we were unable to obtain permission from the relatives, the exact pathological changes could not be determined.

Comment.

It comes as a shock to a surgeon when any commonly practised procedure has an unexpected fatal issue, and a careful investigation followed into the circumstances of the case. Inquiry was made as to possible idiosyncrasy, and it appeared that there were grounds for suspecting this, in that, when on holiday in Aberdeen at one time, the patient had been supplied by a chemist with iodine (in what strength of solution we could not ascertain) for the treatment of an abrasion on the toe, and that its application was followed by a severe local reaction. The actual solutions used in the preparation of this patient were used for other patients without ill effect, and there was no departure from the routine preparation already described. It was possible that the strength of iodine solution standing in an open vessel in the warm atmosphere of an operating theatre might have been increased by evaporation. This had been guarded against by the use in each case of a supply freshly poured from a stoppered bottle. Milder forms of dermatitis appear sometimes to be caused by the use of water to cleanse blood from the skin surrounding the area of the wound after the completion of the operation. Aqueous solutions of iodine are more irritant to the tissues than alcoholic solutions, this being noted when catgut prepared in aqueous iodine solution is used for ligatures, as it seems to favour the production of serum in the wounds. Should any cleansing of the skin round the wound be required after operation spirit or ether should be employed.

It would appear, therefore, that in this case there was a definite and pronounced individual idiosyncrasy to iodine. The actual cause of death was apparently analogous to that in superficial burns from the absorption of toxic products of skin destruction. An interesting feature of the case was the immediate relief to the irritation given by the application of sodium thiosulphate.

Even an exceptional case like this has caused me to review the method of skin preparation preliminary to operation, and I have adopted with success a 1 per cent. solution of iodine in carbon tetrachloride. Over a period of some months only one patient has shown any trace of skin irritation. For many years I used a 3 per cent. solution of picric acid in spirit, and its penetrating power appeared to be great, but the occurrence of dermatitis in a series of cases led me to abandon it.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

EMBOLISM OF THE ABDOMINAL AORTA.

In view of a case recently published in the *British Medical Journal* (November 30th, 1929, p. 1002) I think the following one of a very similar nature is worthy of publication.

A widow, aged 54, had suffered from chorea at the age of 10. Beyond this no other details are available. For many years she had suffered from "rheumatism," but had had no acute attacks. In time she complained of shortness of breath, and had been treated for auricular fibrillation and myocarditis for some years. For the past six months she had had attacks of acute pain over the precordium, radiating to the left shoulder and arm. With treatment these attacks gradually subsided, and I did not see her for about two months. She then sent for me, complaining of acute pain in the lower central abdomen, radiating down both thighs to a little below the knees. The onset had been sudden, and was associated with loss of power and coldness in both lower extremities. When I saw her, three hours after the onset, she was sitting up in bed, very distressed, cyanosed, gasping for breath, and continually clutching at her legs. Her heart was fibrillating, with an apical rate of 110 per minute, and there was a systolic apical murmur. Her feet were cold, but the legs were still warm, and very pale, as were also the thighs. No peripheral pulse could be felt. She could then bend her knees, but had no movement at the ankle-joint. Power at the hip-joint was still present, and she could raise her knees off the bed. The plantar reflexes and knee-jerks were feebly elicited, but no ankle reflexes could be obtained.

She was given 15 grains of potassium bromide and 15 minims of digitalis every four hours, while the legs were well wrapped up in warm coverings. The next morning she felt more comfortable, but still complained of pain in the thighs, and had lost all power below the knees as well as all reflexes and sensation. Three days from the onset she had an anginal attack, and her breathing became "rattly," while the chest was filled with moist sounds. She was given morphine 1/4 grain, atropine 1/100 grain, and digitaline 1/50 grain. Two hours later she felt much more comfortable. By this time she had lost all power in her legs and thighs, the skin of which had assumed the blue mottling seen post mortem, and no reflexes or sensation could be elicited, apart from a small area on both thighs extending downwards for about two inches below Poupart's ligament, and running round the thigh, rising somewhat posteriorly.

The morning after the anginal attack, following a restless night, her colour had much improved, though the heart was still fibrillating. Her legs were in the same condition, and micturition had by now become automatic. She remained in this state till the same evening (four days from the onset), when she had some severe convulsions in both arms. Her bronchi became choked with mucus, and she died. No post-mortem examination could be obtained.

The diagnosis appeared obvious at the first visit—embolism of the abdominal aorta—and, apart from palliative treatment, nothing could be done, as the patient would not consider removal to hospital.

Two points are of interest: (1) The reflexes and sensation, as also the muscular power, did not disappear for about fifteen hours from the onset. (2) The small area where there was still warmth and sensation, the skin of which must have obtained blood from a collateral source.

Hull. T. STIRLING EDDIE, M.B., B.S.Melb.

TAENIA SAGINATA INFECTION.

INFECTION by tapeworm does not appear to be very common in these days of strict control of slaughterhouses and meat inspection, so that the following case, which presented some unusual features, may be of interest.

A Jewess, aged 56, had complained of severe pain in the epigastrium for over six weeks, with occasional vomiting after meals. The usual gastric sedatives had no effect. An examination of the stools for occult blood revealed the ova of *T. saginata*, but no history of the passage of proglottides could be obtained. A drachm and a half dose of the extract of male fern was given on an empty stomach the morning after the discovery of the ova. Within ten minutes the patient collapsed and fell into coma, with twitching of the muscles of the face. Ether was injected intravenously, and the patient vomited some of the drug shortly afterwards. She remained, however, in a stuporous condition for about two hours. The bowels then moved, and she gradually recovered consciousness. A fully matured specimen of *T. saginata* was passed later and the patient made an uninterrupted recovery. No castor oil was taken by the patient for the expulsion of the worm, but I learnt later that she was in the habit of taking a dose of olive oil every night before retiring.

I have to thank Professor R. T. Leiper for his kindness in identifying the species of tapeworm in this case.

Nottingham. A. A. DENHAM, M.B., D.P.H., D.T.M.

Reports of Societies.

DELIRIUM TREMENS: CAUSATION AND TREATMENT.

AT a meeting of the Society for the Study of Inebriety on July 3rd, with Mr. W. MCADAM ECCLES, president, in the chair, a discussion took place on the causation, prevention, and treatment of delirium tremens.

Dr. E. F. WILLS (resident medical superintendent, Rendlesham Hall, Suffolk), in an opening paper, first drew attention to certain points in causation. The delirium was almost unknown in those who had only recently become immoderate drinkers; in other words, it was not in those who had periodic bouts at comparatively long intervals, but in the habitual soaker, that delirium tremens most commonly occurred. It was possible that some intercurrent disease, such as an infection of the nature of influenza, might act as a determining factor in the immoderate drinker. The vexed question of the onset being due to the sudden withdrawal of the usual excessive amount of alcohol taken demanded some further investigation. The experience of those who had to deal with persons admitted into institutions for the treatment of inebriety was that the delirium was more likely to show itself when alcohol was suddenly discontinued to those who had been allowing themselves large quantities right up to admission. This was confirmed by the fact that delirium was less likely to occur when there was a process of tapering the amount taken, even if the tapering under careful observation were fairly rapid. In treatment Dr. Wills laid it down that the alcohol should be tapered, as far as possible, in strict accord with the actual amount taken before the onset of delirium. It was essential to obtain some sleep; probably hyoscine, or hyoscine combined with morphine, was the best method. He urged that the functions of the liver in delirium tremens should be the subject of investigation. Acidosis and acetonuria, both of hepatic origin, had been noticed in cases; ketones had also appeared in the urine, and this matter was really not understood. Finally, it was pleasant to know that the number of cases of delirium tremens was on the decline, and a day might be expected when the disorder would have vanished altogether.

Dr. G. B. GRIFFITHS (a member of the Prison Commission) said that formerly, as a prison medical officer, he saw a good deal of delirium tremens. Many cases came to prison hospital, perhaps a little stupid, and in the course of twenty-four hours developed the delirium. His practice had always been not to taper the alcohol, but to cut it off straight away. Years ago the number of cases seen in prisons was greater than now, but it was never very large. He used to put the patients in a quiet, airy room, where they were under skilled observation; they were given eggs and milk, and so forth, with purges, and he never lost a case, nor did he remember a patient who suffered unduly. The medical officers of London prisons, with whom he had been lately in touch, all declared that delirium tremens did not now exist. One of them said that he had not seen a case for eight years. Between 1920 and 1923, when statistics were gathered for the Board of Liquor Control, there were only four to six cases per annum in the prisons of the country. Asked by the PRESIDENT whether he thought the cutting off of alcohol induced the onset of delirium tremens in some cases, Dr. GRIFFITHS said that he did not think so, though he agreed that the shock of incarceration might have that effect, acting in the same way as the fracture of a limb had been known to do in a likely subject. He had asked the prison medical officers why delirium tremens had diminished, and they suggested the increased price of liquor, the diminution of alcoholic content, also the general rise in intelligence and the multiplication of wholesome interests.

Dr. J. D. ROLLESTON said that when he first joined the staff of a fever hospital delirium tremens was certainly much more prevalent than at present. This was very evident in the severe epidemic of small-pox in 1901–2, when a large number of the patients were men addicted to alcohol. Of recent years, and particularly since the war, the occurrence of delirium tremens had been very slight indeed. Among the 4,000 admissions yearly at the Western Hospital it was rare to see more than one case a year. His practice had been to treat the cases without alcohol. Alcohol had been cut off altogether, with beneficial results.

Dr. T. STACEY WILSON said that he had seen very little delirium tremens in practice, though in his student days at the Edinburgh Royal Infirmary there was a delirium tremens ward. In those days the cases were treated by cutting off alcohol straight away, and the treatment was by digitalis, chloral, and bromide—20 minims of tincture of digitalis, 20 grains of chloral, and 20 grains of bromide—given every two hours until the patient slept. It was rare to have to give more than two or three doses before the patient slept and woke up recovered. In cases of alcohol addiction he had found coramine—a synthetic camphor—very useful.

Dr. H. T. P. YOUNG (Parkhurst) said that he had seen no case of delirium tremens for seven years, although he had had many thousands of prisoners passing through his hands. During the last week, however, a case of the pre-delirium type had come under his observation, and had been treated on the lines he always adopted in these cases, so far with satisfactory results. His plan was to cut off alcohol at once. This man had a history of marked and prolonged alcoholic addiction, and on being admitted to the prison hospital became slightly tremulous; his urine was found to contain a large amount of albumin, and the skin was rather moist. He was given an ordinary purgative, and put upon digitalis and diaphoretics, with a milk diet. During a week no further symptoms pointing to delirium tremens had developed, and the condition was subsiding. Digitalis was given for its diuretic effect.

Dr. W. G. PRIDMORE believed in tapering. He could recall several cases of heavy drinkers coming to hospital—really good old soakers—and on their alcohol being *stopped* completely they developed symptoms, and on the resumption of alcohol they got right. On the other hand, when dealing with drug addiction, he cut off the drug entirely.

Dr. C. W. J. BRASHER recalled the case of a ship steward, who came to the out-patient department with severe scalding. He refused to become an in-patient, but a few days later he was admitted with broncho-pneumonia, and almost immediately developed delirium tremens. He was put on a certain quantity of alcohol, and continued for six weeks in an extremely hallucinated condition, and eventually had to be sent for a time to a mental hospital.

Dr. J. H. MORTON (medical officer, Holloway Prison) said that he had been brought up to believe that the way to treat delirium tremens was by tapering. It was not until he entered the prison service, and saw cases of delirium tremens frequently, that he changed his views entirely. In a hospital in Dublin of which he had had some experience, these people were put on a bottle of stout a day—stout being the liquor to which they had been used—and, perhaps as a consequence, they always had to have one male attendant. Later, when he came upon these cases in prison, he cut alcohol off entirely. The people were put on milk diet and on salines, and after a sleep of sixteen or twenty hours they got over their attack. They were given practically no sedatives, though if the pulse was bad they would be given a hypodermic injection of strychnine; but they did extremely well without any alcohol. The drug-takers needed more watching, but the same principle was followed in nearly all those cases also. In the women's prison hospital for which he was responsible very few cases of delirium tremens were seen.

Mr. MCADAM ECCLES, from the chair, in summing up the discussion, said that he was a little disappointed that no speaker had thrown more light on the question of causation. It would be a slur upon the medical profession of this generation if delirium tremens disappeared, as it might, without its real cause having been discovered. As the result of the report of the present meeting perhaps some biochemist would be interested enough to take up this subject and carry out investigations. If any such would get into touch with Dr. Kelynack or himself, an endeavour would be made to place them in the way of getting material. He was of opinion himself that something circulating in the blood, other than the alcohol, was the cause of delirium tremens.

Reviews.

RADIOGRAPHY OF PEPTIC ULCER.

Peptic Ulcer,[1] by JACOB BUCKSTEIN, is the tenth volume of a series of monographic atlases published in the United States of America under the general heading Annals of Roentgenology. The editor of the series points out that the advances in radiology are so great as to make it almost impossible even for specialists in the subject to be familiar with all the appearances they are likely to be called on to interpret in the course of daily practice. The aim of the editor and publisher has been, therefore, to present a conspectus of standard radiograms prepared by leading authorities in special fields of *x*-ray diagnosis. The present volume on peptic ulcer ably fulfils these requirements. Dr. Buckstein is the specialist on gastro-intestinal *roentgenology* at Cornell University and the Bellevue *Hospital*, and his beautifully illustrated and fully documented book will be welcomed as a means of study and comparison by all who are interested in *x*-ray work on the alimentary tract.

The book opens with a short description of the anatomy and pathology of the stomach. This is followed by a concise account of the history and development of the application of radiology to the study of the normal and diseased stomach. Reiche in 1909 described the *x*-ray appearances of a chronic gastric ulcer verified at necropsy, and in the following year Haudek clearly indicated the diagnostic value of the presence of a niche, often containing opaque material after the rest of the stomach is empty, and of disturbances of motility of the stomach wall. Carman later described three types of spasm which may be associated with gastric ulcer: (1) an incisura due to spastic contraction of the circular muscle fibres in the plane of the ulcer; (2) a diffuse gastro-spasm; and (3) spasm of the pyloric segment, leading to retention of stomach contents. It is in ulcers in the neighbourhood of the pylorus, where the motor function is inhibited through direct involvement of the pyloric ring, either as the result of spasm or organic cicatricial contraction, that retention and gradual gastric enlargement characteristically occur; but retention for many hours may be present with ulcer of the pars media in cases where the pylorus is found to be normal. Further results of cicatrization of gastric ulcers may lead to hour-glass contraction of the stomach, which is invariably secondary to organic disease (Moynihan), or an indrawing or shortening of the lesser curvature on each side of the ulcer, or to coronal radiation of the rugae of the mucous membrane round the ulcer. Of these appearances, however, the presence of a niche is the only absolute diagnostic criterion. Buckstein recommends the double meal favoured by Continental radiologists (cf. Haudek, *British Medical Journal*, 1929, ii, p. 173). Two ounces of barium sulphate are given with some cereal breakfast food six hours before the examination in order to observe the motility. After determining the state of the preliminary meal a further four ounces of barium sulphate suspended in a glass of water are given, and the examination of the oesophagus, stomach, and duodenum is continued. Screening results are supplemented by films, which form both a permanent record and a control of the observations made on the screen. Since the important thing is to demonstrate a niche if present, it is essential to observe the stomach from all angles in order to secure profile. The normal stomach shows a fair variation in size and shape and more particularly in position, but shows no deformity of contour, no break in continuity or interruption in the course of the peristaltic waves of the lesser and greater curvatures.

The author emphasizes the deceptive appearances that may be given by a single film, and refers to the differential diagnosis of deformation of the greater curvature by gas in the splenic flexure, and of the superimposed duodeno-jejunal flexure or of a diverticulum. Two of the pitfalls illustrated, however, are inherent in the double-meal method—namely, superimposed barium in haustrations of the colon from rapid passage of the first meal and superimposed calculus in the left kidney. British radiologists usually prefer to screen the patient empty for opacities in the abdomen, and then to give a single meal, watching the emptying of the stomach at intervals to obtain a strial picture. Malignant disease of the stomach favours the greater curvature, and is characterized by a filling defect, but early indication of the rigidity of infiltrated stomach wall is given by absence of peristalsis in an area observed when serial films are superimposed. In healing gastric ulcer the disappearance of the niche is studied; it is only much later that normal peristalsis in the area involved is resumed. Duodenal ulcer is stated to be six times as frequent as gastric ulcer. In duodenal ulcer a niche is found (it occurred in 19 per cent. of the Bellevue Hospital series); but persistent characteristic deformity of the duodenal bulb is the essential diagnostic feature. Tenderness of the duodenal bulb when it is visualized on the screen is an important aid. With duodenal ulcer there is often exaggerated gastric peristalsis, and in some cases retention of the preliminary meal obscures the duodenal lesion. Complications of gastro-enterostomy, jejunal ulcer and gastro-colic fistula are fully illustrated.

Dr. Buckstein's book is a pleasure to handle, and may be recommended for study and reference to clinicians and radiologists alike.

[1] *Annals of Roentgenology*. Vol. x: *Peptic Ulcer*. By Jacob Buckstein, M.D. New York: P. B. Hoeber, Inc. 1930. (8 × 10½, pp. xxiii + 337; 287 figures. 12 dollars.)

FRENCH VIEWS ON CANCER.

THE second volume of Part V of Roger, Widal, and Teissier's great treatise on medicine[2] is concerned solely with the subject of malignant disease. It has been written by Professor ROUSSY in collaboration with Professor LEROUX and Dr. MAURICE WOLF, and may be taken to represent the orthodox conception of cancer as held in France at the present time.

Recent researches have vastly extended the scope of the subject, which has now passed beyond the limits of medicine and definitely taken its place as a branch of general biology. Accepting this extended view the authors have found it necessary to recast the previous edition completely, and in addition to providing the usual information demanded by those engaged in the practice of medicine and surgery, have entered very fully into such questions as the pathological physiology of the cancer cell and cancer tissue, the experimental production of cancer, the disease as met with in the lower animals, tumours of plants, tissue culture, the action of *x* rays, radium, and chemical substances on malignant growths, the geographical distribution of cancer, and the various organizations which have been established in different countries to combat the disease. These subjects, which, as the authors state, would require several volumes for their adequate treatment, are dealt with as fully as the limited space of eight hundred pages permits.

With regard to the etiology of cancer, the authors distinguish several theories—namely, the theory of simple bacterial infection, the theory of a virus associated with a chemical factor, the theory of cell disease developed mainly by Carrel by the method of tissue culture, the glycolytic theory of Warburg, and the mitotic theory of Boveri and Masson. The essential cause of cancer remains unknown, but the authors consider that recent work on the subject points to some physico-chemical action rather than to bacterial infection. It is agreeable to find that the authors have in the main adhered to the orthodox classification, which has the advantage of being universally understood. The inconvenience of a multiplicity of new names is keenly felt at the present time, and the prevailing custom of conferring unfamiliar names on familiar tumours is a mere "darkening of counsel with words," which leads to confusion. The accounts of the several types of tumour follow in the main the classical descriptions; in one or two particulars, however, the accounts differ from those adopted in this country. For example, English pathologists will experience some difficulty in accepting the view that mixed

[2] *Nouveau Traité de Médecine*. Par G. H. Roger, Fernand Widal, P. J. Teissier. Fascicule v (Tome ii): *Le Cancer*. Par Gustav Roussy, avec la collaboration de Roger Leroux et Maurice Wolf. Deuxième édition, entièrement refondue. Paris: Masson et Cie. 1929. (Sup. roy. 8vo, pp. 845; 284 figures, 19 plates. 100 fr.)

tumours of the parotid are cancers, though they will admit that a malignant transformation is occasionally met with. The tumour has always presented a difficulty, especially the question of its endothelial or epithelial nature, and indeed the whole subject of endothelioma is still obscure. The authors have avoided some of the difficulties by confining the term to tumours of the serous membranes, distributing the remaining growths which usually pass under the name among the sarcomas and epitheliomas. Another tumour, benign in character, which has given rise to differences of opinion, is that affecting the extremities of the long bones and known in this country as myeloma. The authors apparently do not regard it as a tumour; they recognize a malignant growth in that situation—a myelosarcoma—but the very similar bulky enlargements which are still more common and lack the characters of malignancy they apparently regard as inflammatory products. The subject, however, is dismissed in a few lines. An excellent account is given of tumours of the meninges, and the theories of Cushing and Oberling are discussed with discrimination. Paget's disease of the nipple is classified under the keratoses or dyskeratoses, the change in the epithelium being considered to start in the cutaneous surface, in the ducts, or in the depth of the gland, and terminating, as may occur in keratoses elsewhere, in the formation of cancer. It may be remarked in passing that the illustrations to the section dealing with the pathological anatomy possess the artistic qualities which are generally a prominent feature in French works.

The authors conclude their account of the experimental work done on cancer with a summary of the results obtained. This line of inquiry has proved a relation between certain parasites and cancer, as in Fibiger's experiments with spiroptera; an individual predisposition has been shown to exist in some cases, both individual and local, in the form of precancerous conditions; a prolonged period of latency has been shown to characterize the development of the growth; important information has been obtained with regard to the local reaction to the presence of cancer tissue; and, as regards grafted cancer, a natural immunity has been shown to exist, together with the possibility of inducing an artificial immunity. Experiments relating to immunity to spontaneous growths are at present scanty. An extensive account is given of the treatment of cancer by means of x rays and radium, and brief general indications of treatment are summarized as follows: radium treatment is the method of choice, in the opinion of the authors, in cancer of the skin, buccal cavity, and cervix uteri; x rays are preferable in cancer of the larynx, oesophagus, and pharynx; surgical excision is the method of choice in cancer of the breast, rectum, body of uterus, and certain sarcomas, and in cancer of the internal organs.

PHARMACODYNAMY.

ELEMENTS of General Pharmacodynamy,[3] by Professor E. ZUNZ of Brussels, is a very interesting book, in which the author has attempted to describe the general laws regulating the action of drugs on organisms. The need for a volume dealing with these problems has long been felt, but no one hitherto has had the courage to try and cover this very difficult ground. The author deals with such problems as the absorption of drugs, the alterations they undergo in the body, and the laws governing the excretion and cumulation of drugs, and idiosyncrasy and tolerance to drugs.

Pharmacology is one of the youngest of the medical sciences, and of necessity started as a descriptive science. The first stage was analysis of the actions produced on the functions of animals by administration of the drugs that were in common use in medicine. The development of chemotherapy led to extensive studies of the relation between the chemical structure and the pharmacological action of numerous series of drugs, while the introduction of biological standardization directed attention to the laws governing the relation between dosage and action. The literature dealing with these problems is exceptionally difficult to master, for it is of great bulk, and is scattered through a wide variety of journals. Moreover, it presents a vast mass of detail linked by very few established general principles. Consequently the production of the volume under review must have been a very laborious task.

The author points out in his preface that most of the laws of general pharmacology cannot be established until chemistry, physics, physical chemistry, and general physiology have reached a fuller stage of development. His volume is therefore of a provisional nature, and probably many of the tentative conclusions will require modification in the future. Professor Zunz is, however, to be congratulated on his courage in having attempted to tackle this difficult problem. He has brought together into a single volume a great mass of information, and although the evidence available is at present inadequate for the formulation of many general laws, yet this collection of data greatly facilitates the study of the problems involved, and should stimulate future research in this important but neglected field.

[3] *Eléments de Pharmacodynamie Générale.* Par Edgard Zunz. Paris: Masson et Cie. 1930. (6½ × 10, pp. 488; 74 figures. 75 fr.)

IMMUNOLOGY OF PARASITIC INFECTIONS.

THE study of immunology has for so long been associated with bacteriology that there is a tendency to consider it as a part of that science rather than as a part of pathology. The appearance of Professor TALIAFERRO'S *Immunology of Parasitic Infections*[4] is accordingly the more welcome in drawing attention to the part played by animal parasites in the causation of reactions in the host. This volume is the first comprehensive survey of the immunological work that has been done on the infections with animal parasites. It is excellently planned, clearly and lucidly written, and is a contribution of the greatest importance to our knowledge of the processes of disease.

The book is divided into nine chapters, each a complete review of its own aspect of the subject. Chapter 1 deals with concepts of parasitism, infection, and immunity reactions; Chapter 2 with the various serological reactions used in diagnosis—for example, complement fixation, formation of precipitins, and agglutination—with special reference to such conditions as leishmaniasis, trypanosomiasis, malaria, schistosomiasis, hydatid disease, and trichinosis; Chapters 3 and 4 with lysins and reproduction-inhibiting antibodies in relation to the types of infections in trypanosomiasis and malaria, and to the protective and curative effect of immune serums; Chapter 5 with hypersensitiveness and the cutaneous diagnosis tests; Chapter 6 with the production of symptoms by parasites, and with toxins, endotoxins, and hypersensitiveness; Chapters 7 and 8 with the cellular basis of immunity and the nature and production of immunity; and the last chapter with serological and immunological reactions used in the classification of parasites. Each chapter is provided with a useful summary, but the references are collected together at the end of the book, there being over a thousand titles in this part. The volume concludes with a full index.

Professor Taliaferro's book would be a useful addition to the library of the parasitologist and the pathologist if only because it is the first on its subject. But the author has treated the immunology of parasitic infections so exhaustively, lucidly, and systematically that it is sure of a permanent place in all medical libraries.

TREATMENT OF CHILDREN'S DISEASES.

DR. S. A. LEVINSOHN'S translation of the sixth German edition of Professor F. LUST'S authoritative textbook on *The Treatment of Children's Diseases*[5] is very welcome, for since the first appearance of the work in German twelve years ago it has been increasingly recognized as a valuable guide for all paediatricians. Dr. Levinsohn has done more than translate; he has revised and annotated the book, and when once the early irritation caused by interpolated paragraphs in small print is got over the reader will find the translator's notes sensible and helpful.

[4] *The Immunology of Parasitic Infections.* By William H. Taliaferro, Ph.D. The Century Biological Series. New York: The Century Company; London: J. Bale, Sons and Danielsson, Ltd. 1929. (6 × 9, pp. xv + 414; 28 figures. 25s. net.)

[5] *The Treatment of Children's Diseases.* By Professor Dr. F. Lust. Authorized translation of the sixth German edition, with additions by Sandor A. Levinsohn, M.D. London: J. B. Lippincott Company. 1930. (Med. 8vo, pp. vii + 513. 30s. net.)

Part I of the book deals with the diseases of childhood, each introduced by a short diagnostic summary followed by details of treatment, while Part II contains an admirable account of drugs and formulae useful in the treatment of children, including directions for preparing most of the foods used for infants.

A small monograph by Drs. E. LESNÉ and R. CLÉMENT on Diets for Infants[6] might well be read in conjunction with Professor Lust's textbook, for the well-known Gallic enthusiasm for the good things of the table has obviously served as a stimulus for the production of many interesting menus for the infant in health and disease. Sections dealing with broths, with vegetables, cheese, meat, fish, eggs, etc., contain many practical points for doctors, mothers, and cooks. Incidentally these French authors know how to spell Sir Thomas Barlow's name, and thus have the advantage of Dr. Levinsohn.

NOTES ON BOOKS.

DRS. W. RUSSELL BRAIN and E. B. STRAUSS, faced with the necessity of revising *Recent Advances in Neurology*[7] about a year after the publication of the first edition, which was reviewed in our issue of April 6th, 1929, have had to rewrite a number of sections completely, to make substantial additions to others, and to add a considerable amount of new material. Between the publication of one edition of a formal textbook and the next it is usual to allow a decent interval; but only by piling edition swiftly upon edition can the authors of a work purporting to embody recent advances in a growing subject eliminate material that has gone stale, and keep pace with the mass of new observations and discoveries a representative selection of which must be included if the book is to live up to its name. New material in the work under review includes sections on the angiomatous malformations and blood vessel tumours of the brain, measles encephalitis, and the treatment of subacute combined degeneration. The section on acute disseminated encephalomyelitis has been rewritten, and the sections dealing with post-vaccinal encephalitis, serum treatment of anterior poliomyelitis, and the malarial treatment of general paralysis have been revised and enlarged. All the subjects treated in *Recent Advances in Neurology* have a clinical bearing, and their presentation is admirable.

Dr. HARRY STURGEON CROSSEN'S well-known textbook on *Diseases of Women*[8] has again been thoroughly revised, this time with the help of Dr. ROBERT JAMES CROSSEN, whose name appears as co-author on the title-page. Dr. Ehrenfest has completely rewritten the chapter on internal secretions in relation to gynaecology, and attempted to present a guide to rational endocrine therapy in this field; Dr. R. J. Crossen has revised the chapters dealing with bladder and ureteral affections, and Dr. H. S. Brookes, jun., has contributed a new chapter on the lower intestinal tract. Like its predecessors, the present edition is attractively printed, illustrated, and produced, and the authors may be congratulated on their skill in increasing the scope of the work while diminishing its bulk by about 150 pages.

The third edition of Orthopaedy in Childhood,[9] by those distinguished orthopaedic surgeons Professor HANS SPITZY of Vienna and Professor FRITZ LANGE of Munich, does credit to its authors and publishers. The book is intended for paediatrists and general practitioners, but specialists will find a comprehensive bibliography at the end of each section. In his preface Professor Spitzy pleads for a separation of the orthopaedic disorders of childhood from the surgical diseases, not merely because of the great development of surgical technique in the last decade and the simultaneous advance of the orthopaedic specialty, but because in orthopaedics operative treatment, which takes the first place in general surgery, is only one of many forms of treatment, in many conditions mechanical and bloodless methods being more important. The introductory chapter deals with orthopaedics and physical training, taking into account the development of the erect position, gymnastics, and sport. The body of the work is then divided into sections under the following headings: congenital deformities, disturbances of post-foetal development, tuberculosis of bones and joints, palsies, injuries, plaster-of-Paris technique, and physical therapy. Spitzy and Lange's textbook is an excellent guide to the subject of orthopaedics, and can be recommended to all who read German. It is well illustrated.

In his Notes on the History of Surgery in Venezuela,[10] which formed the thesis for his admission to the Venezuelan Academy of Medicine, Dr. P. D. RODRIQUEZ RIVERO gives an interesting description of the progress of surgery in Venezuela from pre-Columbian times down to the present day. Special attention is given to the work of the three outstanding surgical personalities of Venezuela of the nineteenth century—namely, José Vargas, who founded the chairs of anatomy, surgery, and chemistry at the University of Caracas, Guillermo Michelena, a brilliant operator, teacher, and writer, and Acosta Ortiz, described as the prototype of the modern surgeon.

[6] Les Régimes du Nourrisson. Par E. Lesné et Robert Clément. Monographies de Pédiatrie et de Puériculture. Paris: Gauthier-Villars et Cie. 1930. (5½ × 7½, pp. 172. 25 fr.)

[7] *Recent Advances in Neurology.* By W. Russell Brain, D.M.Oxon., M.R.C.P.Lond., and E. B. Strauss, B.M., B.Ch.Oxon., M.R.C.P.Lond. Second edition. London: J. and A. Churchill. 1930. (5¼ × 8¼. 11 xii + 429; 39 figures. 12s. 6d.)

[8] *Diseases of Women.* By Harry Sturgeon Crossen, M.D., F.A.C.S., and Robert James Crossen, M.D. Seventh edition, revised and enlarged. London: H. Kimpton. 1930. (Sup. roy. 8vo, pp. xxxi + 1009; 934 figures, 2 plates. 50s. net.)

[9] *Orthopädie im Kindesalter.* Von Hofrat Professor Dr. Hans Spitzy. Unter mitwirkung von Geh. Hofrat Professor Dr. Fritz Lange. 3, völlig umgearbeitete und vermehrte Auflage. Leipzig: F. C. W. Vogel. 1930. (7¼ × 10¼, pp. vi + 504; 253 figures. M.45.)

[10] *Apuntaciones para la Historia de la Cirurgia en Venezuela.* Por Dr. P. D. Rodriguez Rivero. Caracas: Editorial Sur-America. 1930. (6½ × 9¼, pp. 113.)

PREPARATIONS AND APPLIANCES.

FINE ADJUSTMENT OXYGEN VALVE.

DR. K. B. PINSON (anaesthetist to the Manchester Royal Infirmary) writes: I have made some improvements in the fine adjustment oxygen valve manufactured by the Manchester Machine and Instrument Manufacturing Co., Ltd. (2, Booth Street, Manchester), particularly with regard to the pressure gauge which indicates the quantity of gas left in the cylinder.

The gauge shown in the accompanying illustration has now an improved movement, which obviates back-lash of the pointer, and is also cheaper in production. It is also built as an integral part of the valve, which does away with the comparatively expensive union between gauge and valve—a union, too, which was rather liable to develop leaks if accidentally knocked or tampered with.

A CARBOHYDRATE FOR DIABETICS.

Sionon (Bayer Products Ltd.) is a preparation of sorbit, which is a glucohexite, introduced by Thannhauser for the purpose of supplying to the diabetic a carbohydrate which can be metabolized more easily than glucose. Sionon has a sweet taste, and has a calorific value practically equivalent to glucose. Like other carbohydrates it is slightly laxative, but quantities up to 3 oz. a day rarely produce diarrhoea. It has been reported on favourably by various well-known German clinicians, and appears to deserve trial in the dietetic treatment of diabetes.

LACTOSE IN MINERAL OIL.

Colactin (E. H. Spicer and Co. Ltd., Watford) is a suspension of lactose (40 per cent.) in pure mineral oil (55 per cent.). The preparation is intended for the treatment of alimentary toxaemia. The mineral oil acts as a laxative and checks the digestion and absorption of lactose in the small intestine. Hence the lactose reaches the colon, and there encourages the growth of the harmless *B. acidophilus*, thus tending to inhibit the reproduction of putrefactive organisms. The makers recommend the combined administration of colactin with *B. acidophilus* emulsion.

CALCIUM THERAPY.

Calcimint is a palatable preparation of calcium salts. The distributors in this country (Messrs. Coates and Cooper, 41, Great Tower Street, E.C.3) inform us that it contains the following salts: calcium lactate, calcium carbonate, calcium formate, calcium glycero-phosphate, and calcium phosphate. Calcium salts have been recommended for a very wide variety of diseases, and it is claimed that this is a palatable preparation easily absorbed when given by the mouth.

OXFORD OPHTHALMOLOGICAL CONGRESS.

THE twentieth annual meeting of the Oxford Ophthalmological Congress, founded by the late Robert Doyne in 1910, was held at Oxford on July 10th, 11th, and 12th, the members meeting informally at dinner on July 9th in the Hall of Keble College, which again offered hospitality, as in former years. Each member was accommodated in the College, and the consequent facility for social intercourse was much appreciated. The proceedings of the Congress were conducted in the Department of Human Anatomy of the University, kindly made available by Professor Arthur Thomson, to whom the Congress is under a deep debt of gratitude. In addition to the scientific museums a commercial exhibition was arranged, numerous well-known firms of ophthalmic instrument makers displaying the latest forms of apparatus and instruments. Included in the large number of foreign members and others resident abroad who attended the Congress this year were Professor Gonin of Lausanne, Professor Schüller of Vienna, Dr. Harry Friedenwald of Baltimore, Professor Curran of Kansas City, Drs. Bernard Samuels and Tyson of New York, Dr. Derrick T. Vail, jun., of Cincinnati, Dr. van Heuven of Utrecht, and Dr. André Patry of Geneva.

Toxic Amblyopia.

The proceedings opened on Thursday, July 10th, with a short address of welcome by the Master of the Congress, Mr. A. BERNARD CRIDLAND. Immediately afterwards Dr. Traquair introduced, from the ophthalmological standpoint, a symposium on toxic amblyopia, including retrobulbar neuritis. He was followed by Sir Farquhar Buzzard, who discussed the matter from the point of view of the physician, and Professor J. A. Gunn amplified the subject from the pharmacological aspect. Dr. TRAQUAIR said that to the clinical ophthalmologist retrobulbar neuritis presented itself as a visual defect in the form of a central or paracentral scotoma, not explained by the visible ophthalmoscopic changes in the macular region. He commented on the rapid onset and gradual recovery, which was often complete, the defect varying from slight visual loss to complete blindness. The characters of the scotoma were the predominant involvement of the area of the crossed fibres, and the importance of the detection of quadratic or hemianopic features was emphasized. The appearance of the optic disc might vary from the normal to that of a choked disc, or there might be pallor. The clinical picture varied considerably, irrespective of the different causes, but certain forms showed features which were to some extent distinctive. In retrobulbar neuritis with myelitis the visual defect was bilateral, and might exhibit quadratic features indicating a chiasmal site. There was also gross swelling of the optic discs. The scotoma in Leber's disease was bilateral, with a less pronounced tendency to recovery. In acute retrobulbar neuritis the defect was unilateral, and the tendency to recovery was very pronounced. The pathological basis of the disease was the formation of plaques in the optic nerve, which had a special inclination to affect the papillo-macular fibres. As regards its etiology, retrobulbar neuritis might be regarded as a manifestation of disease elsewhere rather than as a primary disease of the optic nerve; the cause must therefore be sought elsewhere in the body. Differences of opinion existed as to the relative importance of certain causes, such as multiple sclerosis, paranasal sinusitis, and dental and tonsillar infections. The true lesion might not be manifest for a long time. The diagnosis of the cause was based on the study of the eye symptoms and on general physical examination, together with that of the visual fields and the detection of quadratic or hemianopic features in the scotoma. Radiograms were very useful; the tendency to neglect the eye symptoms in favour of a search for a septic focus was to be deprecated. The prognosis was good in the acute form, and usually favourable in others. Complete blindness, even of one eye, was a rare result. The expression "toxic amblyopia" referred to partial blindness due to toxins in the circulation, but no distinct boundary existed between toxic amblyopia and retrobulbar neuritis; the pathological lesion had been found by Roenne to be the same in both. In tobacco amblyopia, as an example, blindness was never produced, and the influence of the physical condition of the patient should always be borne in mind. In quinine amblyopia the visual defect was due to direct toxic action on the nerve elements rather than to retinal ischaemia.

Sir FARQUHAR BUZZARD, approaching the question from the point of view of the physician, quoted a passage in a paper written by his father in the last century, emphasizing the importance of these ocular symptoms in certain nervous diseases. He discussed the clinical aspects of these conditions from a neurological and general medical viewpoint. Professor GUNN dwelt on the pharmacological considerations in these diseases, and suggested much closer co-operation between the pharmacologist and the ophthalmic surgeon; the laboratory worker and the clinician should work hand in hand. The subject of quinine amblyopia was also raised. The discussion was continued by Dr. LEIGHTON DAVIES, who referred especially to the contraction of the visual fields in certain conditions. Other speakers were Mr. GRAY CLEGG, Mr. ADAMS, Drs. ROSA FORD and ANDRÉ PATRY, Mr. MONTAGU HARSTON, Professor SCHÜLLER, Messrs. JOSEPH, BROWNING, HARRISON BUTLER, GREENE, CYRIL WALKER, YOUNG, GIRI, GALLOWAY, HAYCRAFT, and Drs. TYSON, PRIMROSE, and THAKORE. Dr. BERNARD SAMUELS subsequently read a paper on opacities in the vitreous; he showed some beautiful drawings, and fully described their appearances and general character.

The Nature of Light.

In the afternoon Sir OLIVER LODGE, F.R.S., delivered a most interesting and lucid lecture entitled "*Modern* theories on the nature of light" to a large audience. He prefaced his remarks by saying that he did not know how much his hearers knew, and expressed the hope that his address would not be too elementary—a humorous quip which appealed to those present. He first gave a short sketch of the corpuscular and wave theories, and the reasons why the wave theory must be true. He then proceeded to develop the argument that the corpuscular theory must also be true. Modern attempts at the unification of these two theories were then fully described, and a probable theory of the nature of vision was defined. The interaction of matter and radiation was fully dealt with, and its consequences were described. At the conclusion a vote of thanks, proposed by Mr. LESLIE PATON, president of the Ophthalmological Society of the United Kingdom, and seconded by Mr. CYRIL WALKER, was carried with acclamation.

The Doyne Memorial Lecture.

The Doyne Memorial Lecture this year was delivered by Dr. H. FRIEDENWALD of Baltimore, who took for his subject the pathological changes in the retinal blood vessels in arterio-sclerosis and hypertension. The lecturer gave a most minute and careful description of the alterations in the eyes in these conditions, illustrating them clearly by means of a number of lantern slides. This important address does not lend itself to abstracting, and will well repay being studied in the original. Mr. P. ADAMS, the deputy master, and Dr. TRAQUAIR, who proposed and seconded respectively the vote of thanks to the lecturer, expressed the gratitude of the large audience and its appreciation of a contribution of remarkable merit to the eminent series of Doyne Lectures.

Miscellaneous Papers.

On Friday morning an address was given by Professor SCHÜLLER of Vienna, on recent developments in radiology associated with ophthalmology. He first described in much detail the normal variations of the sphenoid, and then passed on to an account of the inflammatory conditions and neoplasms of its sinus. Infiltrating processes were next discussed, and the destruction of the bone by intracranial tumours. Sinuscele of the sphenoid was illustrated, and the deformities found in neuro-fibromatosis

were described. Professor Schüller, who spoke for an hour in faultless English without notes, was listened to with rapt attention, and at its conclusion was accorded an ovation by his large audience. The paper was discussed by Dr. BOWIE, Mr. EDMUND JONES, Dr. TRAQUAIR, and Mr. FOSTER MOORE.

On Friday afternoon an address was given by Professor JULES GONIN of Lausanne, on detachment of the retina and its treatment. He related how he had recognized the truth of Leber's theory that acute detachment was due to vitreous fluid passing through a retinal tear into the subretinal space, and how he had been led by further research to complete that theory and to extend it to all so-called spontaneous or myopic detachments. In all these forms, the tear being the determining cause of the detachment and hindering it from healing, the most certain way to a definite cure was to close the hole by scarring with a thermo-cautery when possible. He stated that in all recent cases, when the hole had been closed, cure was immediate and permanent; relapse of the detachment showed that the tear had not been sealed. If the retinal tears were large or multiple, treatment took long and might be impossible. The author illustrated by means of drawings his procedure for localizing the retinal tear and the method of operating, also the ophthalmoscopic appearances of the detached retina before and after the thermo-puncture. The following members joined in the discussion: Messrs. ORMOND GOULDEN, JULER, HAY, RIDLEY, Sir WILLIAM LISTER, Messrs. HAYCRAFT, GRAY CLEGG, GIRI, HARRISON BUTLER, and LINDSAY REA.

On Saturday morning MR. HARRISON BUTLER read a paper on keratoconus posterior, a hitherto undescribed condition discovered by the aid of the slit-lamp. This was discussed by Dr. MARION GILCHRIST, Miss MANN, Dr. TRAQUAIR, and Mr. GRAY CLEGG.

Dr. TRAQUAIR read notes on new instruments and technique in cataract extraction; his report was discussed by Mr. GRAY CLEGG, Dr. DERRICK VAIL, jun., and Messrs. GREENE, CHAVASSE, STEWART, Professor CURRAN, and Dr. GIRI.

Dr. DE COURCY contributed a paper on interstitial keratitis in workmen's compensation cases. This interesting medico-legal pronouncement attracted much attention, and was discussed by Messrs. HARRISON BUTLER, BICKERTON, YOUNG, JACQUES, PRIMROSE, KENDALL, HAY, ALABASTER, and the MASTER.

Dr. VAN HEUVEN of Utrecht gave a short account of recurrent chronic uveitis, which was illustrated by many excellent lantern slides, and was discussed by Dr. CHAVASSE.

Demonstrations.

During the afternoon of Thursday, July 10th, various demonstrations were given in the Scientific Museum. Mr. BURDON-COOPER demonstrated the orthogon test. Mr. ARTHUR GREENE showed a specimen of ciliary growth causing glaucoma. Dr. TRAQUAIR exhibited a model of a field of vision, and Mr. ALABASTER a stereoscope useful in fusion training. Mr. TUDOR THOMAS gave a demonstration of live rabbits with transparent corneal grafts. Mr. ERNEST MADDOX showed a hand attachment for the wing test, together with a stereoscope.

Social Events.

In the afternoon of July 10th tea was provided for members and their friends at Worcester College, where they were received by the Provost, Mrs. Lys, and Mrs. Bernard Cridland.

In the evening the annual dinner of the Congress was held in the Hall of Keble College, under the presidency of the Master. Among the guests present were Lady Airedale, Sir Farquhar Buzzard, Professor and Mrs. Schüller, Professor Gonin, and Dr. Evans. The dinner was the largest ever held in connexion with the Congress, 142 members and guests being present. The Master in the course of his speech stated that it was the twenty-first year of their history, although only the twentieth meeting; in 1926 there was no Congress owing to the English Speaking Ophthalmological Congress, which was held in London that year. He read a letter from the American Ambassador, regretting that absence abroad made it impossible for him to be present. A letter from the president of the Röntgenological Society of Vienna was also read, congratulating the Congress on being the first one of that specialty to place radiographic diagnosis in the forefront of their programme. Mr. CYRIL WALKER proposed the toast of "The Guests," and Professor SCHÜLLER replied. At the conclusion of the speeches Mr. Gray Clegg presented Mr. Cridland on behalf of the members of the Congress with a gold watch and a set of table silver as a memento of his yeoman services for fourteen years as secretary of the Congress; Mr. Greene presented the Master and Council with a badge of office to be worn on official occasions by the Master in the future. He reported that subscriptions had come in from all over the world for the testimonial, which showed how much Mr. Cridland's strenuous efforts during so many years had been appreciated. Mr. Cridland, who was obviously much affected by this recognition of his work, replied in a charming little speech of thanks.

The proceedings closed on Saturday, July 12th, at midday, and it was the unanimous opinion that it was the most successful meeting in the history of the Congress. Indeed, the number of members present—namely, 149—greatly exceeded any previous record, and severely taxed the capacity of the University Anatomy Theatre and the executive staff of the Congress.

BRITISH EMPIRE CANCER CAMPAIGN.

ANNUAL GENERAL MEETING.

THE DUKE OF YORK, who presided over the annual general meeting of the British Empire Cancer Campaign at the House of Lords on July 14th, said that medical science had achieved much in recent times towards attaining supreme victory over cancer, but very much more remained to be done. The Campaign had always encouraged every form of cancer research, both at home and abroad. Its recent work included the formation of provincial councils in Great Britain, thus establishing new research centres. The International Conference of 1928 was still an outstanding landmark in the medical records of all nations; its immediate result, the launching of the National Radium Fund, was now an accomplished fact, and treatment centres had been brought into existence, but the usefulness of these centres might be extended still further if some form of organization was set up to help poor patients to attend for treatment, especially those who lived at long distances. His Royal Highness congratulated the Grand Council on its decision to issue, early in the autumn, a book bearing the title, *The Truth about Cancer*. He also commended the annual report (summarized below), which contained the record of nearly every research centre in the country, and was a most interesting document.

THE MARQUESS OF READING moved a vote of thanks to the Duke of York for his continued interest in the Campaign, and this was heartily carried. On the motion of Mr. STANFORD CADE, the members of the Grand Council were re-elected.

Sir CHARLES GORDON-WATSON, proposing the adoption of the annual report, said that the policy adopted by the Campaign of pooling all resources, both financial and scientific, was steadily being justified. Cancer research was no longer the independent and unco-ordinated function of a number of different institutions. A study of the annual reports must convince the most sceptical that there was no avenue which was not being explored. Given financial facilities to continue cancer research under the direction of the Campaign, and of sister Campaigns in other countries, it seemed hardly conceivable that the problem could evade solution for much longer. Thanks to the creation of the National Radium Fund, research centres were now fairly well supplied with radium. In the treatment of cancer in one or two regions of the body radium had almost overtaken surgery and might supplant it; but in the present state of knowledge more harm than good was likely to arise if radium were exploited by those

inexperienced in its use. With regard to *x* rays, physicists recently had been able to shorten the wave-length so as to bring this agent in close competition with radium. It was possible now to construct *x*-ray tubes to stand up to 500,000 volts, and thus a weapon of equal potency to radium, but of far greater flexibility, was being forged. In the research for the cause of cancer the Campaign had spent large sums on investigation into serum reactions. He himself believed in the ultimate possibility of the immunization of the body against cancer.

Sir RICHARD GARTON seconded the adoption of the report, and pointed out the need for increased financial support if the requests expected to be received for the subsidy of approved research work were not to be refused.

With the adoption of the annual report and the re-appointment of the auditors, the proceedings concluded, but the quarterly meeting of the Grand Council followed, under the chairmanship of Lord READING, His Royal Highness remaining. On the motion of Sir JOHN BLAND-SUTTON, seconded by Sir THOMAS HORDER, Lord Reading was re-elected chairman of the council. Several grants were approved, including one of £680 for the maintenance of the radon centre at Middlesex Hospital for one year, and one of £300 to Westminster Hospital to carry out the physical part of a scheme of cancer research which had been submitted.

Mr. LOCKHART-MUMMERY said that it was hoped that as a result of the forthcoming visit of the two vice-presidents, Lord Dawson of Penn and Sir John Bland-Sutton, to Canada in connexion with the Annual Meeting of the British Medical Association, some steps might be taken towards the formation of a federal council. In the meantime he proposed that assent be given to an application by the Cancer Service of the Government of Saskatchewan to become a branch of the Campaign; this was approved. He also moved that, in order to prevent overlapping of research work, provincial councils of the Campaign should be asked to furnish details to the Grand Council of all researches they proposed to subsidize before such subsidies were finally decided. This was adopted, as was a further motion by Mr. SAMPSON HANDLEY for the affiliation to the Campaign of the Anti-Cancer Campaign of the University of Adelaide.

THE SEVENTH ANNUAL REPORT.

In presenting its seventh annual report the Grand Council indicates broadly the advances made since the Campaign began. At that time research and treatment were conducted by individuals and small bands of workers with very little co-ordination of effort. There is now a headquarters staff, an intelligence department, and a system of co-ordination by which waste of effort is reduced and workers can learn what others are doing, the fruit of research in one area being made available at once in others. An immense mass of material has become available as a result of the fact that cancer of the skin and breast can now be produced experimentally in mice with almost absolute certainty. Causes of cancer formerly scarcely suspected have been discovered in this way, and the conditions which govern the growth of tumours are being diligently worked out. Treatment of various kinds is being tried, and the ground has been cleared in a most valuable way. The British Empire Cancer Campaign, which has been in close touch with the National Radium Commission since its formation, has co-operated with it in devising forms of record to be used in all cases treated by radium—a matter of very great importance. During the year under review a prize consisting of a medal and £500 has been offered for the best essay on the early diagnosis of cancer. The Campaign is about to issue a popular account of cancer for laymen, explaining its nature and indicating what has been discovered about its origin, course, and treatment. More than £28,000 has been expended during the year, and an appeal is made for still more generous subscriptions. The bulk of the report consists of statements by institutions and individuals in receipt of grants, and certain general conclusions are summarized.

Treatment by Radium.

Several of these statements deal with radium treatment and with research work on the action of gamma rays upon normal and malignant cells. There is a general tendency now to employ smaller doses with increased screening for longer periods, since better results are being obtained as regards the disappearance of growths and increased interference with normal tissues. A popular method is interstitial needling of the base and edges of the growth, combined with the use of radium in surface applicators held in position by wax shields. The best results have been obtained in cancer of the cervix, mouth, tongue, and pharynx, and therefore the benefit of this treatment should soon become evident in a substantial reduction of the annual cancer mortality figures when early cases are dealt with in still larger numbers. The statements relating to treatment of cancer of the rectum in this way are rather more favourable than those of last year. Emphasis is laid on the importance of careful technique, in view of the variable sensitivity of some growths to radium and the varying resistance of different kinds of neoplasmata. In lesions of the skin, cervix, and the floor of the mouth the sequels of treatment by radium are actually better than those of surgical operation. Reference is made to the bomb consisting of 4 grams of radium element lent by the Radium Commission to the Westminster Hospital, the method of employment of which is referred to again in this issue at page 98.

X-Ray Therapy.

Research continues on the use of hard *x* rays in the treatment of cancer; an important and authoritative report has now been issued, based on work done during the past five years. As in the case of radium some tumours have proved to be more resistant than others, and the findings of investigators of this phenomenon are being studied with great care in view of the important relation of this resistance to treatment.

Serological and Cytological Researches.

The possibilities of serum immunization against cancer are being explored in rats and mice with special reference to tumours arising spontaneously, the more resistant type of malignancy. A strain of mice has been obtained from America in which such tumours are very common, and this particular line of research has thus been rendered easier. Some evidence is available that the livers of rats affected by cancer acquire an enhanced immunizing power. Work is continuing on the artificial development of "tissue immunity" to cells of neutral salts, such as strontium chloride and calcium chloride. Mercury has been found to be the most potent heavy metal in stimulating cell proliferation, with silver next, and copper in the third place. It has been deduced that electro-kinetic processes are involved in the cellular reaction, and that possibly a precipitation of the colloids of the cell membrane is an essential phase in the sequence of changes which culminate in cell division. It is now recognized that there is an excessive formation of lactic acid in the growth of cancer cells, as compared with that of normal cells, and also a high ability in the former to produce this acid from dextrose in the presence or absence of oxygen. Pancreatic extracts appear to stop this production of lactic acid, and it is possible that a new practical method of attacking cancer may be evolved. Suggestions have been made that cancer is caused by a poison naturally soluble in fat, and present in the body for a long period before it begins to act; attention is being directed to the possibility of isolating this toxin.

Carcinogenic Agents.

A step forward seems to have been taken in the research for the cancer-producing element by the discovery that substances readily active in this way have a characteristic fluorescence spectrum. Mention is made of the important anti-carcinogenic properties of mustard gas.

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SATURDAY, JULY 19TH, 1930.

THE WINNIPEG PROGRAMME.

ON August 22nd, five weeks hence, the Canadian Medical Association begins the business of its sixty-first annual session at Winnipeg, under the presidency of Professor W. Harvey Smith, and three days later members of the British Medical Association from this country and other parts of the Empire assemble in that city, as guests of our Manitoba colleagues, for the ninety-eighth Annual Meeting of the B.M.A. On August 26th they will be welcomed by the Prime Minister of Canada and the Mayor of Winnipeg, and Professor Harvey Smith, after installation as our President for 1930–31 at the hands of Professor Burgess, will deliver his inaugural address. The Association has only met twice before outside the British Isles, and each time in the Dominion of Canada—at Montreal in 1897, and at Toronto in 1906. On this occasion something more than friendship and common ties will unite visitors and hosts, because since the year 1924 the two professional bodies, by accepting formal affiliation, have come into close organic touch on matters of mutual concern. The Winnipeg meeting of 1930 is thus a landmark in Association history. Those who are fortunate enough to take part in it will have done something to strengthen the links between the profession at home and the profession overseas, and to show that the British Medical Association is Empire-wide in its outlook.

The revised programme of work for the scientific sections, with a good deal of other information about the arrangements for the meeting, appears in our *Supplement* this week. Brief particulars of the journey by sea and land, and some useful hints for travellers, are also given, but any member proposing to go to Winnipeg should apply at once to the Financial Secretary for a copy of the booklet containing full details of the various tours. In general the programme for the Annual Meeting of 1930 follows fairly closely the pattern with which we are familiar on this side of the Atlantic, except that all medico-political business will already have been disposed of at the Annual Representative Meeting which opens to-day at the Association's Headquarters in London. The fourteen Sections are to meet on the mornings of August 27th, 28th, and 29th, and a very varied and interesting list of subjects, both clinical and scientific, has been drawn up for consideration. While the number of set debates is larger than usual and several Sections will combine to discuss borderline topics, the occasional paper has not been elbowed out altogether, and (as an example of how hard it is to draw a clear-cut line) the subject chosen for the joint meeting of the Sections of Surgery and Tuberculosis is so wide that its "discussion" might almost as well be described as a series of independent papers, each concerned with a different aspect of thoracic surgery.

Some of the social events of the week—they include a skating carnival and an Indian pageant—have a very agreeable air of novelty to English eyes. A break with tradition will be perceived also in the announcement of five clinical addresses to be delivered at special afternoon sessions. When our brethren in Canada travel long distances to take part in a medical congress they mean business, and the chance of hearing an authority from these Islands speak to them on his own subject is in their opinion too good to be missed. They expect some fun, but work comes first. Hence Sir William Wheeler, Dr. H. C. Cameron, Sir Lenthal Cheatle, Professor W. E. Dixon, and Sir Farquhar Buzzard (whose subject, perhaps chosen in a spirit of gentle irony, is "Rest, Work, and Play") may be sure of large and appreciative audiences in the Winter Club on summer afternoons. For like reasons, we may suppose, Lord Dawson and Dr. Robert Hutchison have been persuaded by the local executive to address a public meeting on the night of August 27th; and the week's proceedings will fittingly close with the delivery of Lord Moynihan's Listerian Oration, under the chairmanship of Professor John Stewart of Halifax, a veteran surgeon who was Lister's pupil and friend in Edinburgh and is one of the most admired and respected personalities in the Canadian medical profession.

A very warm welcome awaits every member who visits Canada next month. Those on this side who have been in constant touch with them during the past two years and more know that the President-elect and his immediate local colleagues, Dr. J. D. Adamson, Dr. C. A. Mackenzie, and Dr. Ross Mitchell, are determined to make the Winnipeg meeting memorable in the annals of the British Medical Association; and that the Canadian Medical Association, through its general secretary, Dr. T. C. Routley, and its acting-editor, Dr. A. G. Nicholls, is co-operating in the fullest measure. If hard work, enthusiasm, and foresight can ensure success, then the ambition of Professor Harvey Smith and company will be realized. Canada is very good at organizing affairs, large or small. Almost the only thing they cannot guarantee without our help is an attendance from the British Isles worthy of the occasion and of their efforts.

THE INCREASE OF MORTALITY FROM CANCER.

MORE than a generation has passed since the late Dr. E. F. Bashford, Mr. George King, Sir Arthur Newsholme, and others raised the question whether the increase of recorded mortality from cancer were not explicable along lines very different from those which attract the sensation-loving journalist. How far was a mere ageing of the population, due to falling birth rates and death rates, responsible? What was the part played by improved means of diagnosis? These and similar questions were asked, and the official statisticians of many countries have since provided relevant data. It may be permitted to an Englishman, in these days of national pessimism, to take some pride in the fact that the contribution made by his own General Register Office has been of first-rate importance. For twenty years point-to-point comparison of rates of mortality from malignant disease in narrow age groups has been possible—the best way of assessing the importance of the factor of age—and the useful summarizing figures known as standardized rates have been available. Classification by sites has been established, and, finally, by the application of the method of standardization to these site rates, it has become possible for the most casual reader to see at a glance what increase of mortality in each of more than 20 site rates, since 1901–10, has occurred independently of the age factor. The probable effect of changes in medical knowledge has been examined from various aspects, notably in the

masterly essay which formed part of Dr. T. H. C. Stevenson's review of the vital statistics of 1917. Again, the influence of civil state upon mortality from cancer of the breast, ovary, and uterus was examined by Dr. Stevenson as long ago as 1913, and in the report of the League of Nations Committee upon this interesting problem the contribution made by the English General Register Office was substantial.

The English General Register Office has had two great advantages over most other countries—the absolute bulk of its data and the patient sagacity of the great statistician who sits in Farr's seat. But other countries have made progress, and it is gratifying to note that the Registrar-General of the sister kingdom has just published a valuable analysis of Scottish data.[1] Dr. J. C. Dunlop set out to assess the shares of (1) ageing of the population, and (2) increasing facilities of diagnosis, in the absolute increase of mortality. To assess the age factor, Dr. Dunlop has taken the percentage ratio of the sum of the numbers of actually recorded deaths in seven age groups for the year under examination to the sum which would have been recorded had the age-group death rates of 1911 remained applicable. This ratio will not in general be the same as the ratio of the death rates for the years compared, standardized by applying them to a fixed set of age groups; but, for technical reasons, the difference is rarely of importance. Each method of statement has its own advantages and disadvantages. Dr. Dunlop finds that about two-thirds of the increase of mortality among males and four-fifths of the increase among females of mortality from cancer between 1911 and 1928 is directly attributable to the ageing of the population. Of the residue not so attributable a considerable proportion—he is disposed to think perhaps the whole—*other than that due to cancer of the breast*, may be due to better recognition, and therefore may afford no evidence that cancer is, in the popular sense of the term, increasing. In general, the English data, which Dr. Dunlop has tabulated in a comparable way, agree with the Scottish, although there are certain interesting divergencies. Thus in Scotland cancers of the stomach and intestine show net increases of 13.3 and 21.2 per cent. respectively, while the corresponding changes in England are much larger—namely, 22.8 and 46.8 per cent. Cancers of the rectum have increased in England by 17.9 per cent., in Scotland only 6.7 per cent. Having regard to the rather striking results brought out in the recent English analysis of the site distribution of cancer tabulated by social class, it would be interesting to make a similar study of Scottish data, but the smaller absolute bulk of the data might make this impossible.

Dr. Dunlop's arguments for attributing rather greater importance to the factor of improved diagnosis than most medical men have been inclined to do are cogent. He thinks that *x*-ray examination is responsible for the increased recorded incidence of cancer of the lung, and histological examination for the increased frequency of cancer of the prostate and ovary. There is already a considerable literature dealing with the alleged increase of cancer of the lung, and the opinions of pathologists are divergent. There is, however, a logical difficulty, which Dr. Stevenson pointed out in other words thirteen years ago. It is this: One " explains " the increase of mortality from cancer of sites *a*, *b*, and *c* by pointing out that, in respect of these sites, improved means of diagnosis have become available. But then one finds that the rate of mortality from cancer at a site easy of recognition—to quote Dr. Dunlop, " it is almost inconceivable that death can be caused by cancer of the breast without the condition being recognized "—has increased quite appreciably, 11.6 per cent. in Scotland in 1928, 22.7 per cent. in England in 1927 more than can be accounted for by ageing of the population. The devil's advocate will certainly say that as the diagnostic explanation will not hold here, perhaps its apparent value in the other cases is only an appearance. None of the participants in the discussion on Dr. Dunlop's paper seemed to be aware that the statistics of cancer of the breast and uterus have been the object of a special international inquiry. Obviously, if we could explain the increase of cancer of the breast and the decrease of cancer of the uterus wholly in terms of measurable differences in sexual activity, then the logical difficulty would disappear, and we should have no qualms over the apparent exception. Since the rates of mortality from cancer of the breast are strikingly different in different countries the problem looked a simple one. Actually, it proved to be impossible to explain international differences in terms of variations in the proportions of married women. There is no doubt whatever that the rate of mortality from cancer of the breast is, age for age, higher among unmarried women than among married women—and Dr. Dunlop's figures are no exception to the rule. But it does not seem probable that the increase of mortality from cancer of the breast can be satisfactorily explained by any increase in the proportion of spinsters in the female population, although (so far as we are aware) no complete statistical verification has been provided—for example, by standardization for civil state as well as age over a long series of years. Hence the difficulty remains. We cannot be quite sure that the diagnostic factor is so important as we should like to believe. It is to be hoped that Dr. Dunlop's paper will stimulate discussion and investigation.

[1] The Increase in the National Cancer Death Rate and its Causation. By James Craufurd Dunlop, M.D., F.R.C.P.Ed. *Edin. Med. Journ.*, July, 1930.

PLACENTAL HORMONES.

PROFESSOR COLLIP[1] has published some further information respecting the preparation from placenta of a hormone causing the onset of puberty in immature rats. A description is given of the method of preparation, which depends on the solubility of the hormone in alcohol or acetone, its relatively small solubility in water, and its insolubility in ether. A subsidiary method of purification is also described, which consists essentially in adsorption by a colloidal precipitate of calcium phosphate, the active material being recovered by alcoholic extraction. The hormone is neither destroyed by boiling for a short time in acid solution, nor by pepsin or trypsin. It does not, when purified, produce any luteinization of the ovary when injected into rats, thus differing in its action from pregnant urine or implants of anterior pituitary substance. There is evidence, nevertheless, that crude placental extracts made with acid, and the residue after extraction with alcohol, do produce luteinization in addition to accelerating the onset of puberty, thus confirming the suggestion of Wiesner that there are two hormones at least to be extracted from placenta which are similar in action, respectively, to the acid and alkali extracts of anterior pituitary worked with by Evans and his collaborators. Collip, however, still inclines to the view that the hormone he has worked with is distinct from the substance which is present in Evans's acid extracts of pituitary and which has a similar action, because he finds that the placental preparations are not destroyed by digestive enzymes and are effective when

[1] *Canadian Medical Association Journal*, 1930, xxii, 761.

given by mouth, and that extracts of anterior lobe of the pituitary are inactive. He is not, however, dogmatic on this point, for there are pitfalls in arriving at conclusions in connexion with this type of research. The following table gives a condensed summary of some of the more important results of the injection of various preparations.

	Premature Puberty.	Formation of Luteal Tissue in Ovary.	Production of Gigantism.
Anterior pituitary grafts	+	+	+
Acid extracts of anterior pituitary ..	+	+	−
Alkaline extracts of anterior pituitary	−	+	+
Collip's placental extract:			
Pure...	+	−	?
Crude	+	+	?
Residue after alcohol extraction	−	+	?
Urine of pregnancy	+	+	−

Collip proposes the name "emmenin" for the placental hormone that produces premature puberty.

FOOD INVESTIGATIONS.

UNDER modern conditions foods are seldom consumed at their time or place of origin, and their storage or transport in good condition is not only of hygienic interest, but also, where large quantities are concerned, of the first economic importance. It is pointed out in the Report of the Food Investigation Board for 1929[1] that production, transport by sea and land, storage, the wholesale market, and the retail market, are all stages through which much of the food supply of this country has to pass in its progress to the consumer. The food industry is not one but many, and its diversity is well reflected in the variety of the problems which have engaged the attention of the Board's investigators during the year. One inquiry was carried out in order to ascertain the causes of the loss of bloom during the transport of New Zealand frozen mutton and lamb. Thirty one Border Leicester-Southdown cross lambs were slaughtered under supervision, and the carcasses were divided into three lots, covered with stockinette wraps, and frozen at −10° C. The first lot were further wrapped in wax paper to reproduce conditions of high humidity; the second lot were left covered by the stockinette wrap only; the third, also covered with stockinette only, were taken out of store to "sweat" at intervals. When the three lots, after eighteen weeks' storage at −9.7° C., were sent to Smithfield for the opinion of the trade, the first lot were classed as showing perfect bloom, the second lot as slightly dull in appearance, and the third as most unsatisfactory. The first lot realized ½d. per lb. more than the third. The conclusion was drawn that the deficiencies of the second and third lots were entirely due to excessive drying of the muscle. Reference is made to previous experiments conducted under the auspices of the Board on the palatability—which includes tenderness, flavour, juiciness, colour, and texture—of frozen beef. The tests had suggested that the process of freezing had little injurious effect on palatability, but that the unpopularity of imported frozen beef was largely due to its poor initial quality. These views have been confirmed by an experiment organized by the Commonwealth Council for Scientific and Industrial Research, in the course of which quarters of particularly prime Australian beef were frozen in Australia and sent to England for comparison with other samples in respect of palatability, when hot and cold, under cooking tests. The Australian quarters were excelled only by prime Scotch home-killed beef; they were found to be better than Argentine chilled, and much superior to ordinary Australian frozen beef. Preliminary experiments were carried out during the year on the micro-flora of cold stores. In one such store, at 19° F., the air contained only three organisms per litre, and the water melted from the ice round the brine pipes contained only six organisms per cubic centimetre, suggesting that the bacterial contamination of carcasses from aerial sources is under such conditions negligible. In the counts the genus Actinomyces was largely represented, though the manner in which it gained access to the store was not apparent. Biochemical studies on the action of bacteria on meat at different temperatures added weight to the suggestion, made on other grounds, that it is good practice to cool carcasses immediately after slaughter to a temperature near zero. Not only will the growth of any bacteria present be slowed down by the low temperature, but the retardation of autolysis will check the production of the soluble proteolytic derivatives required for bacterial nourishment. Studies of the effect of climatic conditions on the storage life of apples revealed no obvious correlation between the complete growing season and the life of the fruit in storage, but good keeping quality was associated with warm dry weather during the few weeks preceding the date of gathering. An interesting by-product of the work of the Board's investigators was the disclosure of the fact that a low concentration of acetaldehyde in the atmosphere is useful in fruit storage, inhibiting or killing fungal spores without ill effects upon the fruit itself. Another inquiry dealt with the losses of fruit which result from rotting following the invasion of the cut stalks by moulds, with special reference to the suggestion that the treatment of the cut stalks with a fungicide or equivalent preparation would serve as a prophylactic. Some thirty substances, including well-known disinfectants, tried in course of the inquiry were found to give no control or to be objectionable on account of their odour. Complete success was attained by dipping the ends of the cut stalks in molten paraffin wax. The report also contains accounts of investigations on the temperature and wastage of fruit during overseas transport, the freezing and storage of mild-cured bacon, the rate of evaporation from eggs, the corrosion of tin-plate in canning, the refrigeration of fish, and the thermo-physical properties of refrigerants. A description is given of a small refrigerating plant for road and rail transport, using a methyl chloride evaporator and potassium chromate brine, which worked well on railway runs between London and Aberdeen. The concluding section relates to researches conducted for the Director of Food Investigation by the Imperial College of Science and Technology. The whole report is of outstanding interest from the public health point of view.

[1] Report of the Food Investigation Board for the Year 1929. London: H.M. Stationery Office. 1930. 2s. 6d. net.

NOISE IN NEW YORK.

WE learn from a communiqué issued by Dr. Shirley W. Wynne, health commissioner for New York, that the Noise Abatement Committee, appointed by him last November to inquire into the complex noise situation in New York City, has now presented the first part of its report. After a study of the data so far made available through research, the committee is satisfied that "the continual pressure of strident sound to which New Yorkers are subjected tends to produce impairment of hearing, to introduce harmful strain upon the nervous system leading to neurasthenic and psychasthenic states, to cause loss of efficiency of workers and thinkers, and finally to interfere so gravely with sound refreshing sleep that rest is difficult and in some cases impossible." It appears that a medical subcommittee has found definite proof that noise produces undue pressure on the brain, affects metabolism, produces partial or total deafness (upon long exposure), prevents concentration, retards learning both in children and in adults, and interferes

seriously with the normal development of infants and young children. As to the effect of noise on efficiency, an investigation carried out by Dr. J. B. Morgan and others showed serious retardation in the productiveness of office workers. "The necessity of putting forth extra effort to overcome noise creates a continual strain on the nervous system, which must ultimately show itself in reduced capacity for sustained work, clear thinking, and energetic action, the mainstays of civilized life." In regard to impairment of hearing the report says: "The structure of the ear makes it continuously adaptable provided the sounds merge and maintain a more or less uniform level. In traffic and many other city noises this is not the case. Consequently the portion of the ear which controls adaptation gets no rest. After a time the muscles of accommodation, wearied by continual efforts to adjust the hearing to the various thumps, rattles, blasts, and hoots of sound which punctuate the undertone of street noise, fail to react. This lack of function leaves a breach in the protection of the ear, opening the way for occupational deafness and causing additional fatigue and other harmful results. Here in New York this observation can easily be substantiated. Our automobile and taxi drivers are becoming hard of hearing, and the same is known to be the case among boiler workers and other labourers or mechanics exposed to a constant riveting noise." In regard to disturbance of sleep the report declares that a partial abatement of noise during the night will not meet the need of a city as large and diverse as New York: the whole chorus of sound must be decreased at all hours. "The effects of noise have been described by research workers as 'emotional.' Long before the emotions are actively disturbed there are undoubtedly disturbances expressed in heightened pulse rates, increased blood pressure, irregularities in heart rhythm, and, most important of all, in the increase of pressure on the brain. Emotion is only the end-product of the process; the undoubted effect of constant noise is a disturbance of the blood vessel apparatus and an increase in the degenerative processes of the heart and arteries." The committee regards the work it has so far accomplished as merely a preliminary to the abatement of noise. Nevertheless Dr. Wynne is able to report some progress in the direction of actual abatement. Following a conference with representatives of the principal steamship and railroad interests and federal and municipal officials, to consider the problem of unnecessary whistling and other noises attendant upon traffic in New York Harbour, the tugboat and steamship companies and others connected with shipping have agreed to take part in the campaign to diminish din from these sources; and officials in charge of fleets of trucks have undertaken to discourage promiscuous horn-blowing by their drivers. The nuisance arising from radio loudspeakers is being brought under control by local legislation. Henceforward no sound-producing apparatus will be allowed to disturb the quiet or repose of persons in its vicinity, and the use of loudspeakers or other amplifying devices is forbidden in any public street or place without a permit from the police commissioner, or in any case within 250 feet of a school, court house, church, or hospital during the hours when these institutions are in use. "In addition to these definite steps interest in the problem of noise in general has been aroused among engineers and technical men toward the production of less noisy machinery and vehicles, and we have gained the interest and co-operation of newspapers, magazines, and other avenues of publicity. Through these channels a general public realization of the costliness, danger, and needlessness of increasing city noise has been brought about." In making its preliminary survey the committee found that the noise nuisance in cities was by no means a new thing, though the clamour of modern machinery and traffic has made it acute. While other cities, particularly in Europe, have made recent studies of the problem, Dr. Shirley Wynne takes pardonable credit for the fact that the body set up by him in New York is the first to apply scientific methods to its investigation and to consider the problem as a whole.

WAR PSYCHOSES.

WAR psychoses, it is generally held, do not conform to specific types differing in their manifestations and origins from the psychoses of civil life. They develop in reaction to stresses which differ in appearance but not in essence from the stresses of ordinary life: extremes of fatigue and bodily discomfort, constant exposure to danger, to wounds and disease, and to alarming sights and sounds, separation from wife and children, and uncertainty for the future. These conditions are known to favour the production of psychoses; the man on active service may be subjected to all of them, and the longer the war lasts the more would their effects accumulate. Dr. Rodiet and Professor Fribourg-Blanc, from their survey[1] of the psychoses that occurred in the French Army as a result of the great war, reach the conclusion that, though war-time psychoses fall within the usual groups, they differ in some respects from the psychoses of peace-time. War has given them, so to speak, a special colouring, and war psychotics show a more intense reaction than the psychotics of civil life. The survey in question was undertaken at the instigation of the French Army Parliamentary Committee, charged with the duty of accounting for the country's total losses by reason of death, wounds, mental affliction, and other causes; and though Dr. Rodiet and Professor Fribourg-Blanc, after years of painstaking investigation, were unable to make a complete statistical analysis of their allotted field, they have reached a number of valuable conclusions from their study of 25,000 case records collected by the medical staff of the Val-de-Grâce Psychiatrical Centre during and after the war. One of their subjects of study was the relative importance of constitutional factors and of conditions which may be directly ascribed to active service in the production of war psychoses. Among constitutional factors they instance psychopathic inheritance, mental instability, degenerative states, alcoholism, and syphilis, and various organic disorders of the nervous system. In the other group they place emotional and "commotional" shocks, extreme fatigue, wounds, and debilitating diseases resulting from war service. They do not find themselves in agreement with those who believe that underlying most war psychoses was a constitutional tendency; they hold that factors in both groups were responsible for the production of mental disorder. Another matter to which they devote considerable attention is the recruitment of psychopathic persons in time of war. In their book they cite numerous instances of magnificent courage displayed in the trenches by soldiers in the early stages of general paralysis, mania, or melancholia. When such patients became so severely affected as to render them incapable of further service they were, of course, sent to hospital, but till then they were able to give excellent service.

TUBERCULOSIS CONFERENCES AT OSLO AND HAMBURG.

THE seventh conference of the International Union against Tuberculosis is to be held this year at Oslo for three days, commencing on August 13th in the Great Hall of the University. The formal agenda of the meetings includes three main questions of great interest to tuberculosis workers all over the world. The first topic—namely, B.C.G.

[1] *La Folie et la Guerre de 1914–1918.* Par A. Rodiet et A. Fribourg-Blanc. Paris: F. Alcan. 1930. (Fr. 30).

vaccination against tuberculosis—will be introduced by Professor A. Calmette of Paris. The morning session will be devoted to the principal paper and speeches by Drs. William H. Park, Maragliano, and others, and the afternoon will be available for general discussion. This procedure will be followed in the case of the other subjects. The chief speaker on the second subject, thoracoplasty in the treatment of pulmonary tuberculosis, will be Professor P. Bull of Cslo, followed by Dr. Gravesen of Denmark, Mr. Morriston Davies representing Great Britain, Dr. Sauerbruch of Germany, and others. On the last day the conference will discuss the teaching of tuberculosis to medical students and physicians. Professor W. His of Berlin will read the first paper, and contributions will be made by Sir Robert Philip, Drs. Leon Bernard, Willard B. Soper, and representatives of other countries. The afternoon is available for general speeches from members of the conference. During the week, Dr. Heitmann of Oslo will read a paper on antituberculosis work in Norway. The proceedings will be conducted in English and French. Apart from the intrinsic interest of the formal agenda, there are most attractive motor and railway tours to Lillehammer, Molde, and other beautiful localities where the traveller interested in tuberculosis may sail down solemn fjords and visit ancient churches, tarrying here and there at some well-known sanatorium. For a minimum of £6, it will be possible, after the close of the conference, to spend a week in this delightful way, substantial railway and steamship concessions being offered to members. Further particulars may be obtained from the secretary of the National Association for the Prevention of Tuberculosis, Tavistock House North, Tavistock Square, London, W.C.1, to whom application for membership should be addressed. On the way to Oslo those who are interested will have a unique opportunity of attending a prior gathering in the Eppendorf Hospital, Hamburg, on August 7th and 8th, which is organized by the North-West German Tuberculosis Association. Professor Ziegler of Hanover will be the chairman on the first day, and discussions will take place on nutritional therapy in tuberculosis, the manifestations assumed by tuberculosis during its development, and various aspects of pulmonary disease. On the second day, a meeting of the German Research Institution for Tuberculosis will be held, and the topics include the variations in the development of the tubercle bacillus, the surgical treatment of non-tuberculous pulmonary disease, and asthma. During the week there will be demonstrations for small groups on respirational physiology, and blood gas analysis. Opportunities will be given to visit various sanatoriums and institutions near Hamburg, and modern welfare methods will be demonstrated by the Hamburg Board of Health. Applications for membership of this meeting should be addressed to Professor Brauer, Eppendorf Hospital, Hamburg.

CONGRESS FOR SEX RESEARCH.

THE programme for the second International Congress for Sex Research, to be held in London at the House of the British Medical Association from August 3rd to 9th, is now nearing completion. The British organizing committee has endeavoured to provide opportunities not only for consideration of newly established facts, but also for discussion of the bearings of these on modern therapy. At the opening session, on August 4th, Professor F. A. E. Crew will give an address on puberty and maturity, and in the afternoon papers relating to this subject will be presented. Tuesday morning will be devoted to papers on the biology of testicular and ovarian function by representatives of the Strasbourg and Chicago schools, including Professors Bouin, Koch, Carl Moore, and Gallagher, and these will be discussed in the afternoon. On Wednesday morning papers on hormone therapy will be presented by members of the Breslau and Kiel schools, including Professors Fränkl, Fels, and Schröder. On Thursday morning it is proposed to discuss the subject of psychology and biology. Friday morning will be devoted to papers on the biological and therapeutical aspects of the control of human fertility, and reviews of the work that is being done in various countries in this field. The subjects of papers to be presented to sectional meetings include the Aschheim-Zondek test for pregnancy, by Professor Aschheim of Berlin; the corpus luteum hormone, by Dr. Clauberg of Kiel; biological tests of the female hormone (menformone), by assistants from Professor Laqueur's institute in Amsterdam; the channels and significance of excretion of the female sex hormone, by Professor R. T. Frank of New York; the male sex hormone, by Professor S. Loewe of Mannheim; evidence for the metabolic basis of sexuality, by Dr. Oscar Riddle; and human hybrids, by Professor C. G. Seligman. An attempt has been made so to plan this programme that there shall be in it much that should interest the medical practitioner. Membership of the congress is restricted to professional biologists engaged in research or teaching in accredited institutes of anatomy, anthropology, botany, medicine, physiology, psychology, sociology, veterinary science, or zoology, and to members of the medical profession. Those who wish to become members should communicate with the congress secretariat, King's Buildings, the University, Edinburgh, until July 26th, and thereafter at the House of the British Medical Association, Tavistock Square, London, W.C.1.

THE UNIFORM OF NAVAL MEDICAL OFFICERS.

IT is well known that a uniform dress for commissioned officers of His Majesty's Navy was authorized in the year 1748. It is perhaps less well known that the service had a narrow escape from being clad in a combination of grey and red, instead of the famous blue and white. The regulations of 1748 did not apply to medical officers who were appointed by Admiralty warrant, and it was not till 1787 that the *London Gazette* specified for the first time a uniform for "warrant officers and masters' mates." This document is referred to in the April number of the *Mariners' Mirror* (the organ of the Society for Nautical Research, published by the Cambridge University Press). It was not, however, until 1805 that definite rules were promulgated. Upon a proposal from the Commissioners for Sick and Wounded Seamen, the Admiralty obtained an Order in Council, dated January 23rd, 1805, revising their rates of pay, etc. The Admiralty memorial contains the following: "And the Commissioners having further submitted to us the propriety of allowing the medical officers to wear a distinguishing uniform during the time of their being actually employed, and of giving them . . . a comparative rank in the service suitable to their situation, to which consideration it is believed they attach much importance, especially as the regimental surgeons are allowed to rank with captains." The Scheme of Uniform put forward by the Commissioners was accepted by the Admiralty in May, 1805. It specified full-dress and undress for physicians, surgeons, dispensers of hospitals, assistant surgeons, and hospital mates. "All medical officers to wear the sword established for officers of the Navy." It is to be noted that only physicians were allowed gold lace, half an inch wide, round the cuffs and collar. There is no description of the hat, but that is not remarkable, because it is on record that years later no colour was specified for a post-captain's hat, and that excellent but eccentric officer Sir John Phillimore (died 1840) once visited My Lords of Whitehall in a white one, in order to emphasize the omission.

NEURO-HYPOPHYSEAL MECHANISMS FROM A CLINICAL STANDPOINT.

LISTER MEMORIAL LECTURE.

THE Lister Memorial Lecture was delivered by Professor HARVEY CUSHING at the Royal College of Surgeons of England on July 9th, with the President, LORD MOYNIHAN, in the chair.

Professor Cushing said that Lister was that rare combination, a surgeon and a savant; the high esteem in which science was held at the Royal College was indicated by the true savants who, from Richard Owen to Arthur Keith, had been conservators of the Museum.

The central nervous system lay within a bony case, protected by tough membranes; and the pituitary body, like a nugget in a series of Chinese boxes, had a special membranous and bony case of its own. Why had Nature thus safeguarded it? Galen had thought it to be a filter for the escape of pituitary humours to the nose. Willis, in the seventeenth century, said that "the blood . . . before it is let into the cerebrum takes some part of the superfluous serum of the pituitary gland," but later this conception was swept away by the belief that the organ was a vestigial remnant. It was not until it was discovered that acromegaly and gigantism were usually associated with an hypophyseal tumour that interest in the gland revived. Of late years French and American workers had stimulated interest in the interbrain, and some symptoms formerly thought to be due to lesions of the pituitary were now said to depend on lesions of the hypothalamic region. He wished to bring these divergent views into association.

The adenomata of the pituitary, in the first place, were of three types, and of these, two were associated with evidence of glandular hypersecretion. Adenomata in general, long regarded as curiosities, were proving to be of disturbing physiological significance. Cases of cystic degeneration of bones were being found to depend on adenomata of the parathyroids. Adenomata of the islet cells of the pancreas led to a condition resembling overdosage with insulin. The two common types of pituitary adenomata arising from the anterior lobe were the chromophil cell type, associated with acromegaly, and the chromophobe cell type, associated with arrest of growth and adiposity—the reverse syndrome to gigantism. But both these syndromes were associated with reduction of the reproductive function, which at first sight seemed unreasonable. It had been demonstrated by Evans of California, however, that an emulsion made from the anterior lobe and injected into female rats interrupted the reproductive cycle, and later it was demonstrated that two hormones were obtainable from this portion of the gland: one which was concerned with growth, and one with reproduction. The basophil cells of the anterior lobe were responsible for the reproductive secretion, and were, of course, compressed and destroyed by either of the foregoing adenomata arising within the sella turcica. An adenoma of these basophil cells, however, gave rise to the condition of virilism.

The recent researches on the hypothalamus had rather overshadowed theories of the function of the posterior lobe of the gland, but he would attempt to restore some of its interest. In any case it was probably intimately associated with the diencephalon in relation to the haemodynamic, oxytocic, antidiuretic, pigmentary, antipyretic, and sudorific functions. Experimental results obtained by extirpation of the posterior lobe had been attributed to accidental injury of the hypothalamus during the operation, and it had even been doubted whether the destruction of the hypophysis had anything whatever to do with these results. In the rat, however, it was possible to approach the pituitary without injuring the brain, owing to the existence of a diaphragm similar to that covering the sella turcica in man. P. E. Smith had taken advantage of this fact to show that lesions of the pituitary alone gave rise to interference with growth and sexual development, but that injuries to the tuber gave rise to adiposity. Richter had shown that a stab wound just anterior to the hypophysis in the rat gave rise to persistent polyuria.

But though this would seem to give a definite hypothalamic as opposed to an hypophyseal syndrome, it should be remembered that from the supraoptic and paraventricular nuclei of the diencephalon non-medullated nerve fibres passed down the infundibulum to ramify in the posterior pituitary lobe and its epithelial investment. It was impossible to speak of diencephalic lesions as separate from the pituitary. Herring described, in 1908, the invasion of the posterior lobe by cells from the pars intermedia and the transformation of these cells into hyaline bodies which appeared to pass towards the ventricle; mechanical obstruction of the hypophyseal stalk led to a damming back of this hyaline material. There was evidence that this material represented a secretory principle which possibly affected the nerve centres of the hypothalamus. It had been found that a small silver clip placed on the infundibular stalk, without inflicting injury on other structures, led to a persistent polyuria which lasted until the animal was sacrificed two years later. Polyurias produced by injuries to the hypothalamic region could be counteracted by the injection of extract of the posterior lobe, suggesting that this portion of the gland lay under the control of the nerve centres injured.

Deposition of fat was more marked after injuries to the diencephalon than after extirpation of the posterior lobe, but occurred in both cases.

Temporary glycosuria might be produced both by hypophysectomy and by hypothalamic injuries. The glycosuria provoked by Bernard's piqûre depended only on the injury in the fourth ventricle of a relay station for glycogenolytic impulses originating higher up. In the glycosuria of acromegaly possibly the neural portion of the gland was activated, giving rise to hyperglycaemia and glycosuria. Injuries to the hypothalamus might also produce dystrophia adiposo genitalis; possibly a functional discharge in this region normally acted on the anterior lobe of the gland to free the reproductive secretion. Temperature regulation was disturbed by hypothalamic injuries. Sleep appeared to be controlled by the diencephalic centres, as Hess had shown by inducing sleep in cats on stimulation of a certain hypothalamic area. Encephalitis lethargica, which struck chiefly at this region, led to disturbances of sleep, but somnolence was also associated with deficiency adenomata of the anterior lobe, when the diencephalon appeared to have escaped injury.

The diencephalon represented the primitive emotional region. Removal of the upper parts of the hemispheres in a dog led to a complete change of character: the animal became extremely irritable, and exhibited bursts of "sham rage," in which the blood pressure rose and blood sugar was increased. The primitive emotional mechanism was here acting uncontrolled by the higher centres. The pituitary body was developed from a downgrowth of this most primitive part of the brain—a part which existed in any organism which could be said to have a brain at all—and from an upgrowth of the buccal epithelium. If, in the tadpole, the buccal portion was removed at an early stage, pigmentation disappeared, the fat organ persisted, and metamorphosis did not occur; the infundibular portion of the gland failed to develop; it required to come into contact with the buccal epithelium before its normal growth would take place. Furthermore, if the buccal portion was transplanted it did not develop unless a part of the nervous tissue were included with it.

Only occasionally did pituitary tumours evoke a definite march of symptoms. This had been observed in the case of a girl 13 years of age, who suffered first from an oculomotor palsy and subsequently from blindness of her right eye. A radiograph suggested suprasellar tumour, and on inquiry a history of polydipsia, polyuria, temporary adiposity, and somnolence was discovered. Vision later became impaired in the other eye and was followed by a progressive change in personality, the child becoming uncontrollable. Persistent fever, ranging from 101° to 104°, arose and persisted for ten weeks. At operation a malignant glioblastoma was found, involving the chiasma

and spreading into the ventricle. She died forty-eight hours later in a state of hyperthermia with a rectal temperature of 108°.

After summarizing his points Professor Harvey Cushing concluded by saying that though information might be gained by study of the independent parts of the diencephalo-hypophyseal mechanism, it could only be properly interpreted, philosophically at least, when looked on as a whole and in relation to the entire organism. He quoted Thomas Willis, who said of the rete mirabile: "There is no thing in the whole fabric of an animal body more worthy of admiration . . . nothing can be conceived as more skillful and nothing which argues more forcefully the providence of a highest author."

BACTERIOLOGICAL CONTROL OF WATER SUPPLIES.

PROFESSOR J. M. BEATTIE'S ADDRESS TO THE BRITISH WATERWORKS ASSOCIATION.

AT the nineteenth annual meeting of the British Waterworks Association, which was opened at Liverpool on July 9th, Professor J. M. BEATTIE, M.D., professor of bacteriology, Liverpool University, and bacteriologist to the city and port of Liverpool, read a paper on the value of regular and systematic examination of water and the interpretation of results.

The practice at Liverpool, as Professor Beattie explained, is to examine daily the water as supplied to the city, and to examine monthly the water from the storage reservoirs at Prescott and from the deep wells. Samples are taken at less regular intervals from various parts of Lake Vyrnwy, the artificial reservoir in Montgomeryshire for the water supply of Liverpool, also from the principal feeders of the lake, from several points along the course of the pipe line from Vyrnwy to Oswestry, where are the filter beds, and at Oswestry from both the unfiltered and the filtered water. It was in 1897 that the first arrangements were made for a systematic examination of the bacteria in Liverpool water, and at that time a routine daily examination was not practised in any other large British city.

Professor Beattie addressed himself to the question whether this method of investigation was really necessary and afforded any important information.

Multiplication of Bacteria in Water.

The main object of the examination, he said, was to determine whether the water had been subjected to faecal contamination, and, in consequence, whether it was possible that various disease-producing organisms, such as those of enteric fever, dysentery, and cholera, were being distributed over the area of supply. Another factor of importance was that bacteria flourished best in water which contained organic impurities; thus a bacterial count might give important indications as to the amount of such impurity. If the amount was considerable the water became a more favourable medium for bacterial growth, and if, by chance, the water in this condition became contaminated with faecal organisms, their growth would be more active and their multiplication more extensive. On the other hand, if the organic impurity was small in amount, the chances of disease-producing organisms multiplying would be considerably lessened, and the risk of infection correspondingly diminished. A systematic examination, therefore, enabled the water to be kept at "the minimum point of risk"—that is to say, in such a condition that the disease-producing bacteria, if they gained access, had little chance of surviving or multiplying.

Some American investigations were cited in the paper, showing how important a part was played by food materials (organic matter) in the multiplication of bacteria in water. Temperature was another factor to be considered, but its effect varied with the amount of organic matter present. A rise of temperature favoured bacterial growth if the water contained an ample food supply, but when the organic matter was small in quantity a rise of temperature actually caused a diminution in the number of organisms. Regular information regarding the total bacterial count of a water supply was thus a very important indication to the water engineer, not merely as to the immediate purity of his supply, but as to the capability of the water for dealing with a chance contamination of disease-producing organisms.

Sporadic Infection Due to Water Supply.

Granted that epidemic disease from water supply was a rare occurrence, this was not to say that contamination with disease-producing bacteria was also uncommon. It might be that these organisms occurred in water supply more commonly than was thought, but if the supply was a really satisfactory one, no epidemic would follow, owing to the difficulty of the organisms in surviving or multiplying. It was very common in any city to find isolated cases of typhoid or paratyphoid in which no cause of infection could be traced. Could a clear verdict be given that the water supply was not responsible? In a properly controlled water supply these pathogenic organisms would be few in number and not uniformly distributed, so that, unless the contamination was marked, they were likely to give rise only to isolated cases of infection. Even a universal agent like the water supply might be the channel of sporadic infections while still not giving rise to any epidemic. No system of bacteriological examination could prevent isolated cases of infection, but in the absence of regular examination such a source of infection would remain undiscovered and isolated cases go on indefinitely.

In one city, in 1924, as many as twenty-four cases of paratyphoid were notified, as compared with sixteen for the five preceding years. The occurrences suggested that the agent responsible was something widely used, but not heavily infected. The cases occurred during the early part of the year, and in the latter part of the previous year the *B. coli* content of the water had been high and remained so. This led to investigation, in which organisms of the paratyphoid type were isolated. Probably these organisms were the causal factor of the outbreak, but the search for them was wholly dependent on the regular examination of the water and the finding of excessive numbers of *B. coli* continually over a period. If a medium were available by which pathogenic bacteria could be isolated from water an enormous advance would be possible, a single examination in such a case being sufficient; but although there was a medium useful for the isolation of *B. typhosus* from the stools and from ordinary sewage, its value in bacteriological examination of water was not established.

Standards of Purity.

Professor Beattie complained of medical officers of health that too often they had a notion that the presence of *B. coli* in less than 100 c.cm. of water was a serious matter. It was said that this was "Houston's standard," overlooking the fact that Houston had always asserted that the standard was only tentative, and to be controlled by knowledge of local conditions. One American bacteriologist had declared that the discovery of a colon bacillus in 50 c.cm. of water, or even occasionally in 5 c.cm., afforded no reasonable ground for casting suspicion on the character of the water. The possibility of contamination with colon bacillus derived not from man but from domestic animals and birds had to be borne in mind. A commission appointed in the United States had established the standard that "not more than one out of five 10 c.cm. of any sample examined show the presence of *B. coli*." In Professor Beattie's view, this was quite a good working basis if used with an intelligent knowledge of local conditions, and particularly if the conditions were more or less continuous for a few days.

Filtration: Action of Ultra-violet Rays.

Passing to some other points, Professor Beattie said that ordinary sand filtration not only removed large quantities of bacteria, but also much of the organic material whereon the bacteria lived. Houston had shown that sand filtration, after storage of the water for thirty days, removed 98 per cent. of the residual bacteria. But filtration must not be taken as a certain means of getting a pure supply. It was

only after the filter had been in use for a short time that it reached its maximum efficiency, and, further, this efficiency was not of very long duration.

As to the claim that ultra-violet radiation from the sun played an effective part in destroying bacteria in water, Professor Beattie said that that view had been supported by laboratory experiments, in which, however, the water was exposed in shallow vessels. In nature these conditions did not obtain. The opacity of the water prevented penetration of the rays. In open storage reservoirs where the water was clear and the rays of the sun penetrated a distance probably of three or four feet, there was a certain amount of effect, but the sun in Britain could not be regarded as a serious agent for bacterial purification of water supplies.

In conclusion, Professor Beattie repeated that the real object of a bacteriological examination of water was to ensure a supply free from disease-producing intestinal organisms. For many years typhoid was the disease against which it was specially desired to guard; more recently the paratyphoid fevers had taken its place. Dysentery, particularly the bacillary form, had become much more common within the last few years, and some food-poisoning organisms—for example, Gaertner's bacilli, which were not uncommon in the lower animals, such as mice and birds—had been found in the water supply. Regular and thorough examination was essential, but the interpretation of the results called for special care and experience.

Ireland.

New Lectureship at Trinity College, Dublin.

THE Board of Trinity College, Dublin, has received from Miss Sarah H. Purser a sum of money to bring in £100 per annum in order to found, as a permanent memorial to her brother, the late Professor John Mallet Purser, a lectureship in connexion with the School of Physic. A lecture will be delivered each year, dealing with some scientific subject in which he was interested. Dr. Purser occupied the chair of the institutes of medicine (physiology and histology) in the School of Physic for twenty-seven years, and for eight years was Regius Professor of Physic. He organized the first instruction in practical pathology which was given in Dublin, and his lectures and clinical teaching are still remembered with gratitude by his former pupils. Several years ago he made a gift of £10,000 for the advancement of medical and scientific education in the University, and the interest on this sum has been the means of providing additional apparatus for teaching in those departments which undertake practical courses. The Purser Medal, which was founded in the year 1899 by his former pupils, and is awarded annually in the subject of physiology, bears on the obverse an excellent likeness of the late Regius Professor.

Public Health Conference in Dublin.

On the invitation of the Minister for Local Government and Public Health (General R. Mulcahy) representatives from all the County Health Boards in the Irish Free State met recently at a conference in Dublin. The Chief Medical Officer, Dr. E. F. Stephenson, was present, as well as the county medical officers of health of the Irish Free State. General Mulcahy, who presided, said, in the course of his address, that it was the first occasion on which representatives of all public health authorities in the country had assembled at such a conference, and he hoped that it would be the forerunner of many more. Since the opening of the present century a marked decrease had taken place in the number of deaths caused by preventable disease. Some of the diseases that formerly ravaged the country had almost disappeared; the mortality caused by others had been enormously reduced. Small-pox, which was responsible for over 6,000 deaths in Ireland from 1870 to 1880, had not appeared in the mortality returns for twenty-three years. Typhus, enteric, and scarlet fever had been greatly diminished. Pulmonary tuberculosis had been definitely on the down grade for over twenty-five years. The general death rate had fallen from 18 per 1,000 in 1871 to 1880 to 14 per 1,000 in 1928, and the census revealed that the expectation of life, which had remained almost stationary between 1870 and 1900, was greater at all ages and for both sexes in the first quarter of the present century. This record, said General Mulcahy, encouraged the hope that many of the diseases that still afflicted the community would be mastered in time. Progress could not be attributed to any single cause. Better housing, purer food, more widespread knowledge of the laws of healthy living, better organization of public health work, had all played a part in the advance, side by side with the increased knowledge that medical science had placed at their service. They should not, however, look back too complacently, for the Registrar-General's returns showed that tuberculosis, heart disease, influenza, bronchitis, and pneumonia still carried off thousands every year. The mortality figures did not indicate the amount of invalidism, disability, and physical defect that reduced and destroyed the happiness and well-being of thousands, or the economic loss of avoidable physical impairment. Public health involved more than the promotion of water and sewerage schemes, and the isolation of infective disease. These activities were as important as ever, but communal activities must also be directed towards improving the health and well-being of the individual. Prevention was better and cheaper than cure. The wise development of the preventive side of public health was more of an investment than an outlay. Under the child welfare schemes, and in the school, the medical side of the public health service did most valuable work in discovering conditions that brought about ill-health in adult life.

Dr. J. C. Saunders, medical officer of health for the City of Cork, read a paper on health education and the methods by which it could be promoted. He said that the greatest stumbling-block to the promotion of health education was the fact that health legislation was generally years ahead of public opinion. Prevention of disease, he said, was only now taking hold of the people, but it was becoming of greater importance every day. Attention to the smaller ailments of children, such as enlarged tonsils, adenoids, defective teeth, and other ills, would go a long way towards preventing disease in later life. Parents still objected to vaccination and to sending their children to an isolation hospital. Although vaccination had been proved to be the greatest preventive of disease, yet there were people who objected to it. Comparison of the outbreaks of small-pox in Ireland and England, where only 30 per cent. of the children were vaccinated, showed what vaccination had done for the health of the Free State. Communal hygiene, he contended, should be national rather than local, and should be put into effect by a central organization. Dr. B. O'Beirne, medical officer of health, Galway, said that infectious disease cost the ratepayers of Galway over £3,000 a year. Insurance companies had a lot of money in hand, and if they expended less on benefits through improvement in public health they ought to be prepared to lend money for this purpose to the authorities concerned, at a low rate of interest. Dr. R. Condy, medical officer of health for Cork County, in the course of a discussion on county health administration, advocated the replacement of the present part-time office of subsanitary officer by a fully trained whole-time service. He realized the difficulty of a county medical officer of health taking over the functions of an executive sanitary officer, although this was desirable in some respects. Dr. Condy referred to the proper production and handling of milk, meat, and other foods which directly concerned the county medical officer in the protection of the health of the people. Where the circumstances of the area made it possible, as in urban areas and large towns, by-laws providing for a system of inspection and stamping of all meat before sale should be introduced, urban powers being obtained when necessary. Inspection at the time of slaughter was of special importance, and in the absence of public abattoirs could best be carried out by the mutual co-operation of the veterinary officers and victuallers. The employment of untrained sub-officers for milk inspection was unsatisfactory. Special training and experience was necessary for this work, which should preferably be in the hands of qualified veterinary surgeons in order to gain the confidence and co-operation

of the farmer. The annual report of the county medical officer of health should be the chief medium for giving public information about the Health Department and about the character and extent of the health work done over a given period.

Dr. Harbison, medical officer of health, Kildare, said that the county medical officer of health should be the book-keeper and auditor of the health of his community. He must report fully to his board, and through it to the community, the vital statistics indicating preventable wastage of life and the results of the efforts to improve health and save life. The medical officer had also a vital part to play in the health education of the people. The expense was only a secondary thing if they could wipe out disease in the country. The generous financial aid given towards housing by the Government was doing a lot to eliminate the white plague, and he hoped that housing grants would be made in an even more generous way in the future. Dr. M. Russell, medical officer of health, Dublin, Dr. T. F. Higgins, medical officer of health, Meath, and Dr. McDonnell of the Public Health Department, also took part in the discussion. Dr. M. M. O'Leary, school medical officer, Dublin, in a paper on the health of the school child said that the hygiene of the growing child was scientifically of more importance to the nation than that of the adult. Owing to the large school population (between 50,000 and 60,000) and the small staff of two medical officers engaged in the work, the system so far adopted in Dublin had been in the nature of a general survey. All children with any defects, obvious to parents or teachers, were examined irrespective of age. In addition, all apparently normal children were examined in three routine age groups—entrants aged 5 to 6 years, intermediates aged 8 to 9 years, and leavers aged 12 years and over. By this means it was hoped no child would escape inspection. From the point of view of the school medical service, rheumatism was one of the most serious defects of the school child, leading to prolonged absences from school and chronic invalidism, permanent crippling, or early death from heart disease. The discovery and removal of diseased teeth and tonsils seemed a small price to pay to ensure against the disastrous consequences of this neglect.

Scotland.

Radium Supply in Scotland.

SEVERAL medical institutions in Glasgow have now organized their services for the treatment of cancer by radium. As recently mentioned in these columns the Glasgow Royal Cancer Hospital, with the help of a gift of £10,000 from Lady Constance Burrell, purchased a quantity of radium in November, 1928, to augment its original supply. A central department of the Glasgow and West of Scotland Radium Committee at Glasgow University has possessed for a number of years about 700 mg. of radium acquired at a cost of about £9,000, from which radium emanation is still supplied to the three infirmaries of the city, as well as to the Royal Cancer Hospital and Royal Samaritan Hospital. In 1928 the Western Infirmary, as the result of a gift of £5,000 from Sir Henry and Lady Mechan, obtained a supply of radium which was sufficient at that time for the immediate requirements of the Western Infirmary. By special arrangement this supply has also been available to the hospital staff for the treatment of private patients, its administration being under the charge of Dr. A. A. Charteris, the Donald research scholar in the latter institution. The Glasgow Western Infirmary was subsequently selected by the National Radium Commission, after consultation with the medical faculty of Glasgow University, as the National Radium Centre for the West of Scotland, and the Infirmary has received the first consignment of radium allocated to it in this capacity. The National Radium Commission was constituted about a year ago, after a successful appeal had been made for a National Radium Fund. Two bodies deal with this Fund, the Radium Trust and the Radium Commission, the Trust being charged with the duty of purchasing the radium, and the Commission with its custody, distribution, and use. After consulting the medical faculties of the different medical schools, the Commission selects an institution as the national centre for a given part of the country. The centre for the East of Scotland is the Royal Infirmary of Edinburgh, which received its supply of radium about three weeks ago. In each case the Government supply of radium will be used in the respective hospitals only for purposes of research and treatment, while the rest of the radium belonging to the hospitals will be employed at their discretion for outside work as well. Other national radium centres have still to be established.

Retirement of St. Andrews Professor.

A meeting of St. Andrews University Court was held on July 9th, when a letter was read from Professor Lewis Robertson Sutherland intimating his resignation from the chair of pathology as at September 30th next. It was agreed to make interim arrangements for carrying on the work of the department during the coming academic year, and to defer taking steps to fill the vacancy. Professor Sutherland graduated M.B., C.M. at Glasgow University in 1890, and after a period of study abroad became assistant to the professor of pathology at Glasgow University and demonstrator of pathological anatomy at the Western Infirmary, as well as pathologist to the Royal Hospital for Sick Children, Glasgow. He was appointed to the chair of pathology at the University of St. Andrews in 1899, and at the same time became pathologist to the Royal Infirmary of Dundee. His name is well known as the editor of recent editions of the *Manual of Pathology*, originally produced by Professor Coats of Glasgow. At the same meeting Dr. Walter F. Harper, B.Sc., Ph.D., was appointed full-time assistant in the department of anatomy at Dundee, Dr. F. M. T. Skae remaining a part-time assistant. It was also intimated that Emeritus Professor Musgrove (formerly Bute Professor of Anatomy in the United College) had presented an epidiascope to the department of physiology.

Cremation in Scotland.

The ninth annual conference of the Federation of Cremation Authorities in Great Britain was held in Edinburgh on July 5th and 7th. Bailie John Dickson welcomed the delegates on behalf of the Lord Provost and Corporation. It was evident, he said, that the Cremation Society was making great progress in spite of the difficulty of changing public opinion. Progress, however, had not been so rapid in Scotland as in England. Mr. J. Dan Easson, secretary of the Edinburgh Crematorium, mentioned that in the nine months during which this crematorium had been in operation, 86 cremations had been carried out—31 of these at a reduced rate. He suggested that standard forms should be adopted by all cremation authorities containing printed instructions to doctors in regard to the terms of their certificates. Dr. A. A. Mussen, medical officer of health for Liverpool, said that most medical men were in favour of cremation, and it would be a good thing if medical students were instructed in their final year regarding the statutory regulations and the necessary certificates. It was stated that in Edinburgh the charges for a cremation, including the fees for medical certificates, amounted to less than £15, including carriages. Professor Sydney Smith of the forensic medicine department of Edinburgh University, speaking on the subject of cremation and crime, referred to the question whether the present regulations under the Cremation Act were sufficient to prevent the concealment of crime. Two medical certificates, he said, were necessary; the first contained about nineteen questions; the second, which was a confirmatory certificate, had to be filled up by an independent doctor. The two certificates were then passed to a medical referee, who decided whether cremation could be carried out. In the majority of deaths no suspicions could possibly arise, and, where death was due to poison, the sudden onset of characteristic symptoms in a previously healthy person terminating rapidly in death was sufficient to arouse the doctor's suspicions. Where poison had been taken in small doses over a long period, the doctor again was almost certain to have his suspicions aroused by the symptoms, or if improvement in the patient's condition coincided with

his absence from the source of poison. In such a case, if cremation were demanded, an immediate examination would be necessary. Professor Smith referred to the Chapman poisoning case of 1903, where the sudden death of a girl, after symptoms suggesting poison, had called for an examination both in this case and in that of two women with whom Chapman had been previously associated. These two bodies having been exhumed and examined, Chapman was found guilty of three murders. At the trial the judge remarked that if cremation had been employed the discovery of Chapman's previous guilt would have been impossible. It was pointed out, however, that if cremation had been asked for in the case of the first woman poisoned by Chapman, the circumstances of death could not possibly have escaped notice, and Chapman would have been found guilty there and then. Cremation might therefore be regarded as an actual preventive of crime. Colonel P. S. Lelean, professor of public health in the University of Edinburgh, speaking on "dissolution," remarked that two-thirds of the human body consisted of water, which evaporated after death, while the body tissues were slowly resolved into their simple elements, so that finally there remained only about two and a half pounds of solid mineral matter, or in the case of cremation, of ash. In the cremation chamber, with a temperature of 1,600° C., the gaseous elements were immediately converted into innocuous products. The result was more quickly achieved than by the slow process of natural decay. During the last five years, he said, approximately twenty-five acres of land in Edinburgh, which would have provided playgrounds for children, had been wasted on the burial of corpses. If it were true, as alleged, that 4,000,000 children in this country had no ground on which to play, it was criminal that land should be uselessly employed for the interment of the dead. The tradition of incineration was an old one among the Romans and Greeks, who saw in the smoke of the funeral pyre the ascent of the spirit. Incineration would strike a blow at the morbidity which surrounded a graveyard.

Training of Scottish Nurses.

At the annual meeting of the Edinburgh Club for Nurses an address was delivered by Dr. J. Parlane Kinloch, Chief Medical Officer of the Department of Health for Scotland. Dr. Kinloch said that certain aspects of the training of nurses required consideration as a result of the new Local Government Act. The supply of trained nurses was not affected, but there was evidence that they were emigrating in large numbers. Prospects were better for them abroad than at home, and it was expected that there would be a serious shortage of trained nurses in this country before long. It was satisfactory that Scotland should be a training ground of nurses for a wider area, but measures must be taken to prevent a consequent deficiency in this country. In his opinion, the requisites were better organization of training, better status for the trained nurse, and increased remuneration for her work. Hitherto there had been a complete separation between the nursing and teaching professions; he thought that they must co-operate more and more. There were important differences in the training of a nurse and of a doctor. The medical student had five years' intensive training in the whole range of medical experience, but a woman who wished to take up nursing and to reach the head of this profession had to spend three years in a general hospital, three years in a fever hospital, six months in maternity training, a period in studying mental disorders, and so on. Practically she had to spend about ten years as a pupil before she could become an all-round nurse; this was an impossible state of affairs. The representatives of the nursing profession must devise a far-sighted policy to provide nurses with a comprehensive training. He regarded the Queen's Institute of District Nursing as the chief institute for training the public health visitor, but local authorities in the principal towns had largely trained their own health visitors; here again there was an evidence of lack of contact. There had been a tendency to make the health visitor a kind of specialized social worker at the expense of nursing proficiency, and this was quite wrong. He regarded nursing as the ideal profession for women, but at present it was not so well organized as the teaching profession, for many suitable recruits were lost during the interval between leaving school and the commencement of their training. He suggested that it might be possible for the nursing colleges to recruit girls at the age of 16 or 17. They would get preliminary instruction in biology, physics, chemistry, anatomy, and hygiene. At present studies had to be undertaken along with a hard day's nursing. After such preliminary training, they could at the age of 18 take up general hospital work for a year, and afterwards pass to fever and maternity hospitals, so that at the end of four or five years they could have a wide training in nursing and in preventive medicine. This would call for a spirit of accommodation all round in hospital work, but it would raise nursing to a higher level.

England and Wales.

The New Queen Charlotte's Hospital.

THE first section of the new Queen Charlotte's Maternity Hospital, in Goldhawk Road, Hammersmith, was opened by Princess Mary, Countess of Harewood, on July 10th. The new institution, which will be the largest maternity hospital in the British Empire, and will form with its abundant clinical material and provision for research a sort of staff college for the maternity service, is to consist eventually of a number of buildings grouped around a central lawn, the whole site being five acres in extent. The principal frontage will be occupied by the administration offices, the students' college, and the nurses' home. To one side of this will be an out-patients' block, with ante-natal and infant welfare departments, all on one story; at the rear an isolation block, consisting of three stories, and beyond this the research laboratory. On the other side will be the main hospital, containing 248 beds—a 100-bed unit at each extremity, and a labour ward of 48 beds in the centre. Elsewhere in the grounds there is to be a middle-class paying patients' block, of five stories, with from 80 to 100 single-bed private wards. The work on the isolation block, for puerperal fever cases, has been carried through in advance of the rest of the construction, and it was this block which was opened by Princess Mary. Each of the three stories comprises a five-bed ward, five single-bed wards, and a nursery for ten infants. The wards have french windows opening on to broad balconies facing south. The Princess was received by the president of the hospital, Lord Howard de Walden, and the chairman of the National Mother-Saving Campaign, Lady Howard de Walden. After the hospital had been dedicated "to the Glory of God and in Memory of Her Majesty Queen Charlotte" Sir Almroth Wright, a member of the consulting staff, stated that the present building would be devoted to the treatment and study of puerperal fever, which was responsible for very many of the deaths of women following upon childbirth. The number of such deaths was not diminishing, and it was necessary to look for new resources in dealing with this baffling problem of infection. He described his own continual disappointments during the forty years in which he had been engaged in research work in connexion with infections conveyed by micro-organisms. Princess Mary, having received a golden key from the architect, Mr. E. Stanley Hall, unlocked the door of the isolation block and declared the building open. Thanks were expressed to Her Royal Highness by Sir Samuel Scott, chairman of the committee of management, and by the Mayor of Hammersmith. Among those presented to the Princess were Mrs. Philip Snowden (vice-chairman of the National Mother-Saving Campaign), and the following medical men: Dr. T. Watts Eden, Dr. A. W. Bourne, Dr. Trevor B. Davies, Dr. L. C. Rivett, Dr. L. G. Phillips, Dr. C. S. Lane-Roberts, Dr. L. H. W. Williams, Dr. Leonard Colebrook, and Dr. Eric Pritchard.

Cancer Research in Yorkshire.

The annual report of the Yorkshire Council of the British Empire Cancer Campaign has now been published; details are given of the satisfactory progress which has been made in general administration and scientific research. Sir Harold Mackintosh, on behalf of the honorary secretaries, remarks that in view of the generous response to the appeal for financial support the previous concentration on collecting funds has given place largely to attention to the question of directing as wisely as possible the expenditure on cancer research. New moneys received during the year under review amounted to £1,828, the smallest amount yet contributed, but obtained without any active efforts; the hope is expressed that the Campaign will continue to benefit by such unsolicited and welcome support. Actual research absorbs 97 per cent. of the expenditure, the remaining 3 per cent. being devoted in equal proportions to propaganda and administration. Professor R. D. Passey, who contributes a report on behalf of the department of experimental pathology and cancer research in the University of Leeds, states that Dr. Young has continued his work on experimental hyperplasia, and that more evidence has been accumulated in favour of the view that simple proliferation in the pulmonary epithelial cells of the rabbit is governed by physico-chemical principles. Details are given of experiments designed to elucidate the nature of the action of heavy metals on the living cells, and the development of "tissue immunity" to solutions of neutral salts such as strontium and calcium chloride. Dr. Berenblum has obtained evidence that, when two cancer-inducing agents are applied concurrently to the same area of skin, the result may be a mutual inhibition, though when each is applied alone for a certain period a summation of effect may result. During investigation of the action of mustard gas it was observed that the epithelial hyperplasia which develops invariably during the initial stage of tarring experiments continues when mustard gas is added to the tar, although the ultimate development of the tumours is inhibited, thus providing a good example of a continued state of hyperplasia which does not necessarily develop into neoplasia. The reputed inability of blast-furnace tar to produce tumours was tested and was not substantiated, though its carcinogenic activity was found to be less than that of horizontal retort gas tar. Experiments on the Rous tumour in fowls have been repeated during the year under review; it is concluded that infections from bird to bird rarely take place under reasonable conditions of housing, unless opportunity is offered for direct transmission by pecking. Dr. Harold Channon and Mr. Collinson, proceeding with their investigations on blood fat, have obtained results which bear on the method of transport of unsaturated acids from the liver to the tissues. Professor Passey's report contains also short accounts of research work undertaken with the aid of special grants. Professor E. Mellanby records cancer investigations continued at the University of Sheffield from 1929 to 1930. An examination has been made of the chemical changes in cancerous tissues, and especially those changes which are known to differ from the corresponding ones in normal tissues. Attention has been directed also to the effect of diet and other factors on the initiation and growth of tumours in mice. It has been shown that the mechanism of the production of lactic acid in cancer tissues differs completely from that concerned in muscle. The development of tar tumours in mice has been proved to depend on the ease of access of this agent to the reacting skin cells by virtue of its solubility in the skin fats. Inhibition of the cancerous reaction was found to follow the application of petroleum ether to the skin before the tar applications.

The Marie Curie Hospital in London.

Although the Marie Curie Hospital at Swiss Cottage, for the treatment by radium of women suffering from cancer and allied diseases, has been receiving patients since last September, the formal opening took place on July 10th, when Mr. Stanley Baldwin, M.P., supported by the French and Belgian Ambassadors, performed the ceremony. The hospital has been founded by the Cancer Research Committee of the London Association of the Medical Women's Federation, and is organized and staffed entirely by women. The work of which it is the outcome was started five or six years ago, after a number of those participating in it had visited Continental clinics to study radium treatment. The support of the Medical Research Council and of the British Empire Cancer Campaign was enlisted, and a supply of radium, which now amounts to one gram, was obtained. For a time the work was carried out from four hospitals—namely, the Royal Free, the Elizabeth Garrett Anderson, the South London Hospital for Women, and the New Sussex Hospital, Brighton—the radium being taken from one place to another as required. The need for the centralization of activity became evident, and a pleasant house, No. 2, Fitzjohn's Avenue, was acquired and adapted, becoming in a sense a special annexe to the four institutions named. At a private reception before the opening, with Mrs. Runciman, chairman of the Appeal Committee as hostess, brief addresses on the work done and contemplated were given by Dr. Hurdon, the director, and Dr. Helen Chambers, the pathologist. It was stated that, although the results were extremely encouraging and confirmed those of Continental and other clinics regarding the value of radium in uterine disorders, the time was not ripe for any final report, since five years had not yet elapsed since the first cases were treated. Every patient was being followed up, and the ultimate results were recorded on uniform lines. Since the work was started in 1925 between 400 and 500 cases of uterine cancer had been treated by radium; of the operable cases 90 per cent. were free from all signs and symptoms of cancer, and the inoperable cases, with few exceptions, had greatly benefited. The cases treated were not limited to the malignant group; an increasingly important part of the work of the clinic was the treatment of non-malignant haemorrhagic conditions of the uterus, in which radium was successful in the majority of cases. The hospital at present contained thirty beds, including five private wards with two beds each, and two with one bed. Plans were being prepared for a new wing with additional wards to bring the beds up to fifty, and for the provision of an *x*-ray department, a pathological laboratory, and more nurses' accommodation.

Mr. Stanley Baldwin, opening the hospital with a golden key presented by the architect (Miss Elizabeth Scott), paid a tribute to the radiological pioneers, some of whom, he said, had given their lives and many their health in establishing the technique of radiological application. Dr. Maud Mary Chadburn, chairman of the committee of management, and of the cancer research committee of the hospital, said that there was a certain reserve between the sexes which prevented many women from consulting medical men just on the chance that there might be something wrong. They waited until the condition became worse, and if the case was really one of cancer, the result of such waiting was disastrous. It was hoped that this women's effort on behalf of women would lead to many cancer cases being treated earlier, thereby reducing the terrible mortality. The French Ambassador (M. Fleuriau) read a message from Madame Curie, in Paris, wishing success to the undertaking.

New General Hospital for Margate and District.

The new Margate and District General Hospital was opened by Prince and Princess Arthur of Connaught on July 3rd. The address of welcome presented to them stated that the Margate cottage hospital, which had served the district admirably for thirty years, had become inadequate from the point of view of accommodation, possessing as it did only thirty beds, lately increased to fifty by the construction of a temporary wooden annexe. Plans for a new general hospital were formulated, and an appeal for funds was launched at a representative meeting of citizens in March, 1926. Of the sum of £70,000 required, £57,000 was secured before the opening, mostly as a result of local effort. Prince Arthur, in reply to the address, congratulated the people of the town and neighbourhood upon their courage and foresight in embarking upon an ambitious scheme for the building of an entirely new hospital. From his own personal experience as chairman of the Middlesex Hospital he well knew the magnitude of the task, but, as all who worked for hospitals knew full well, even when an ideal site had been secured, as in this instance, and

a really fine building constructed, the task was not finished, nor could ever be. Those connected with hospitals had always to be up and doing to keep abreast of the amazing progress which was being made in science, research, and hospital organization. He was delighted, though not in the least surprised, to be told of the loyal and devoted services of the staff of the Margate Hospital, both doctors and nurses. He then proceeded to open the building with a golden key presented by the architects (Messrs. Adams, Holden, and Pearson of London), and accompanied by the president of the hospital, Captain J. I. H. Friend, and the medical superintendent, Dr. W. G. Sutcliffe, made a tour of inspection. The new hospital is planned symmetrically on a fine open site in St. Peter's Road. An endeavour has been made to preserve in the larger institution the homely and friendly atmosphere which has characterized for thirty years the work of the cottage hospital which it is replacing. The south-west wing, on the ground floor, provides accommodation for 14 paying patients in rooms containing one, two, or three beds, and the south-west wing has 18 beds for medical cases. On the first floor there are two large 18-bed wards for surgical cases, one for men and the other for women, and there is a children's ward with eight cots, opening on to a balcony facing east. The wards are all arranged to overlook distant country; they are away from the road, and out of hearing of noisy traffic. Special attention has been paid to the *x*-ray department, which has been planned so that eventually, when funds become available, they may house the modern transformer outfit and *x*-ray therapeutic installations which it is hoped to possess. The out-patient department, the two maternity rooms with vita-glass windows, the sisters' and nurses' residential rooms, as well as the administration offices and service sections, are all designed in accordance with the most modern ideas of hospital construction. Judging by the scenes on the opening day, Thanet is very proud of this new hospital, which is the outcome of local effort. The very bricks with which it is faced have been made by Kentish hands.

Correspondence.

SYME'S AMPUTATION.

SIR,—On page 42 of the *Journal* of July 5th Mr. A. H. Moseley of Sydney states: "I quite agree about the Syme amputation; it has not been a success on the whole." In contrast with this view, however, the operation as described by Professor Syme gave excellent results. His account was published in *Syme's Observations in Clinical Surgery*, dated 1861, a book which is now difficult to obtain. On that account I have copied out the following description.

"In performing the operation, the foot being held at a right angle to the leg, the point of a common straight bistoury should be introduced immediately below the fibula at the centre of its malleolar projection, and then carried across the integuments of the sole in a straight line to the same level on the opposite side. The operator having next placed the fingers of his left hand upon the heel, and inserted the point of his thumb into the incision, pushes in the knife with its blade parallel to the bone, and cuts close to the osseous surface, at the same time pressing the flap backwards, until the tuberosity is fairly turned, when, joining the two extremities of the first incision by a transverse one across the instep, he opens the joint, and, carrying his knife downwards, on each side of the astragalus, divides the lateral ligaments, so as to complete the disarticulation. Lastly, the knife is drawn round the extremities of the tibia and fibula, so as to expose them sufficiently for being grasped by the hand, and removed by the saw. After the vessels have been tied, and before the edges of the wound have been stitched together, an opening should be made through the posterior part of the flap, where it is thinnest, to afford a dependent drain for the matter, as there must always be too much blood retained in the cavity to permit of union by the first intention. The dressing should be of the lightest description. . . . The advantages of this operation are, in the first place, its facility and simplicity, requiring no tourniquet, and being completed, so far as the disarticulation is concerned, without any hurry in less than a minute; secondly, its not implicating any large blood vessels, or nerves, so as to expose the patient to the risk of suffering from haemorrhage or nervous pains; thirdly, its protection against the chance of exfoliation by the spongy nature of the bone divided; and, fourthly, its affording a stump so perfect as to give the requisite support without any extraneous assistance. No other stump of the lower extremity can bear pressure on its face sufficiently for supporting the body but the one in question, or, at least, be so used without inconvenience, and there was a man, lately at the hospital, who, after having had both of his feet amputated, could not only stand, but walk, and run, without aid of any kind whatever."

As to the practical value of Syme's amputation, I find a reference to it in *Memorials of the Life of James Syme* (p. 181), where Dr. Hudson of New York makes the following comment.

"No amputation of the inferior extremity can ever compare in its value to the subject with that of the ankle-joint originated by Mr. Syme. . . . One gentleman, for whom I applied a foot, has walked thirty-five miles in a day on a hunting excursion, while his companions did not suspect that he was otherwise than whole."

—I am, etc.,

July 8th. CHARLES W. CATHCART,
Consulting Surgeon, Royal Infirmary, Edinburgh.

INTRAVENOUS SCLEROSING SOLUTIONS.

SIR,—In the *Journal* of July 12th (p. 59) Dr. T. H. T. Barber mentions the successful use of sodium morrhuate in the treatment of varicose veins, and thinks it may supersede other sclerosing agents; Dr. A. S. Ross also reports good results from injecting haemorrhoids with this preparation. I may therefore be permitted to point out that I first prepared sodium morrhuate in 1918 in Calcutta for use in leprosy and tubercle, and I found that in strengths of over 3 per cent. it caused a strictly localized mild inflammation of the vein wall, followed by firm fibrous occlusion of the vessel; just as did the intravenous injection of sodium hydnocarpate and sodium gynocardate do to an even greater degree, the intravenous use of which in leprosy I first reported in the *British Medical Journal* of October 21st, 1916 (p. 550). None of these preparations increase the coagulability of the blood, so there appears to be no danger of embolism resulting, and very slight pain or discomfort follows their use, although if several cubic centimetres of the hydnocarpate solution is injected rapidly into a vein harmless ephemeral giddiness may result. Five per cent. solutions are probably best for producing sclerosing of blood vessels, and the drugs can be sterilized by heat or by adding 0.5 per cent. carbolic acid. Sodium gynocardate is made by Martindale and Co., and "alepol," now so largely used in leprosy, consists mainly of sodium hydnocarpate.

Some years ago I suggested to a surgical colleague a trial of sodium hydnocarpate solutions by injection into hydroceles after tapping. I also tried unsuccessfully to persuade a patient with a hopeless bulging thoracic aneurysm to allow sodium hydnocarpate to be injected into it, and I still think such a trial is indicated in otherwise hopeless cases to induce a deposit of firm fibrin on the inner wall of the dilated vessel.—I am, etc.,

London, N.W.1, July 14th. LEONARD ROGERS.

SIR,—In the *Journal* of July 12th Dr. T. H. T. Barber mentions the use of sodium morrhuate in the injection treatment of varicose veins. I have lately used this solution in a few cases; it appears to give less pain, and to be no less effective than quinine urethane, which I generally use.

A few days ago I gave a patient 1.3 c.cm. sodium morrhuate; just after the dressing had been applied she complained of feeling faint, and became unconscious. She was pallid, the pulse and heart beats were very faint, and the breathing was shallow. Some six or seven minutes later she had slight general twitching, retched several times, and then began to come round. Some strychnine and strophanthus were given hypodermically. Two hours later she was fairly well, complaining only of slight headache. She explained that just after the injection she felt pain in the head, throbbing in the ears, definite pain under the left breast, and a "curious numbness." She has, on previous occasions, had quinine urethane injections in the other leg without any untoward happening.

The sclerosing effect of the sodium morrhuate injection was most satisfactory; it was injected into a large vein

at the ankle, and the vein was thrombosed to the level of the head of the fibula. But one feels inclined to doubt the safety of the drug after the above experience.—I am, etc.,

St. Annes-on-the-Sea, July 12th. A. H. WINCHESTER, F.R.C.S.Ed.

THE TECHNIQUE OF INJECTING VARICOSE VEINS.

SIR,—Dr. Noel Scott's article on the treatment of varicose veins by injection, in the *Journal* of July 12th (p. 58), will be read with much interest by practitioners who have already had some experience in the chemical sclerosis of varicose veins. His use of a lithium solution for veins, and his method of injecting ulcers with the quinine solution, are genuine advances in our knowledge of the subject.

But I am not in agreement with Dr. Scott's description of the actual technique of injection, and I cannot understand his statement that veins are more easily injected when they are collapsed. Surely this is not so. The more distended a vein is, the more easily can it be entered with a needle. He is right when he states that the ideal position for the patient is prone upon a couch, and I submit that such a position is practicable in every case, provided that a suitable tourniquet is used. Dr. Scott states, however, that a tourniquet produces venous engorgement, is difficult to manage single-handed, and causes considerable pain to the patient. Each of these statements is wrong. The tourniquet need cause no harmful engorgement; its function is to maintain such a column of blood in the vein when the leg is elevated as is present when the patient is standing. The tourniquet which I employ is not difficult to use single-handed, and its application is quite painless. It was made for me by Messrs. Woolley of Manchester, and consists of a rubber bag, rather larger than that used in a sphygmomanometer, and enclosed in a linen washable sheath. A stout webbing strap is slotted into the sheath and fastens with a buckle. A length of rubber tubing and a bulb, fitted with a release valve, provide the means of inflation.

The patient stands on the affected limb, the tourniquet is lightly strapped in position, which, if the lower part of the leg is being treated, is just above the knee. The bag is inflated just sufficiently to maintain the distension present in the erect position, and the patient lies down. His foot is elevated on a cushion or low stool. The needle is then inserted, and if one has a syringe with a slackly fitting plunger it will be unnecessary to withdraw the latter to ascertain when the vein has been entered. Owing to the intravenous pressure blood will flow into the syringe immediately the needle is in the lumen of the vein. The valve of the tourniquet is released, the vein rapidly empties, and the injection is made slowly.

There is no need to massage the solution along the vein, as suggested by some writers; gravity carries it upwards. After the injection has been completed a few moments will suffice for the sclerosing solution to have passed beyond the site of injection, when the needle can be withdrawn and the puncture sealed with collodion. The patient remains in the prone position for a minute, when he can be allowed to get up.

The advantages of this method are that from the moment the needle is inserted until the patient steps off the couch the leg is absolutely immobile; there is no leakage of blood when the needle is withdrawn, and, with reasonable care, no case of complete penetration of the vein need occur.—I am, etc.,

Runcorn, July 12th. ALFRED R. ROOKE.

HORSESHOE KIDNEY.

SIR,—I have read with interest the recent report by Mr. Arthur Jacobs (July 5th, p. 8), and the letter of Mr. A. Clifford Morson (July 12th, p. 80). In excretion urography we now have a method which makes for greater precision in the diagnosis of this condition. Unless the renal function is greatly impaired we are able to get by an intravenous injection of uroselectan a clear picture of the size, shape, and disposition of the renal substance as well as the actual drainage system. A horseshoe-shaped kidney is readily outlined in the radiogram (other abnormalities in size and shape may be clearly shown). The method will also show whether the junctional band consists of true renal substance or merely fibrous tissue.

In April last a young girl was admitted to the infirmary here with vague abdominal symptoms and swelling, which, on examination, was thought to be a horseshoe kidney. Intravenous pyelography proved this supposition to be correct, and at the same time showed that the junctional band consisted of actual renal tissue. Recently the same procedure was utilized in demonstrating the shape and size of a "cake-like" kidney which was lying partly in the right iliac fossa and partly in the pelvis. It had become infected, and the clinical picture closely simulated an appendix abscess. More details of these (and other) cases will, I hope, be published shortly in an article on excretion urography.—I am, etc.,

Surgical Unit, Cardiff, July 14th. ROBERT V. COOKE.

AORTIC ANEURYSM SIMULATING PULMONARY DISEASE.

SIR,—Dr. R. B. Myles's letter on July 12th (p. 79) on the interesting case of aortic aneurysm which simulated bronchitis, indicating the value of a radiogram in the diagnosis, and the two previous cases of the simulation of asthma reported in the *Journal* by Drs. Cock and Hill, tempt me, while this subject is fresh in the minds of your readers, to refer to three cases—which I hope to report fully at a later date. These were cases of syphilitic aortitis (two with aneurysmal dilatation) with histories of cough, blood-stained expectoration, loss of weight, evening temperature, and sweats—symptoms due mainly to a secondary pulmonary congestion—which had been sent to me at my tuberculosis clinic as suspicious cases of phthisis. I referred to these cases in a paper I read on the problems of differential diagnosis before the Tuberculosis Association.

I think it will be generally admitted that the importance of careful routine clinical and radiological examination in suspicious chest cases—not excluding the importance of a full history and examination of available sputum—cannot be too strongly emphasized. Not infrequently the history and clinical examination alone have proved in the hands of most chest clinicians to be deceptive, and it would be foolish to deny this. As has been frequently stated clinical and radiological examinations of the chest are complementary and not competitive methods of examination. Just as in every case percussion and auscultation are routine methods of examination of the chest, so routine radioscopy should be practised. Only in this way will accurate early diagnosis be obtained and, in my opinion, such cases as have been reported will prove to be less rare than is generally supposed. It is of interest to note that at a recent discussion at the Royal Society of Medicine on syphilitic aortitis both Professor Leschke of Berlin and Dr. John Parkinson emphasized how rapidly routine *x*-ray examination was taking the premier place in early diagnosis.—I am, etc.,

London, S.W.1, July 12th. PHILIP ELLMAN.

OCCIPITO-POSTERIOR POSITIONS.

SIR,—It may be of interest that occipito-posterior positions seem to be unknown among races that habitually squat for urination and defaecation (no doubt they occur in the richer people who have adopted English habits as regards chairs and the closet). It is obvious that the child's back must come forward when the mother adopts the squatting position. I suggest this as treatment (of course before the head has entered the brim).

For years I have asked expectant mothers to use a chamber rather than the closet for the daily evacuation, as I found they then needed no aperient. It cured constipation, stretched their sacro-iliac joints, and strengthened the perineum.—I am, etc.,

London, W.1, July 13th. KATHLEEN VAUGHAN.

PROGNOSIS IN UTERINE CANCER.

SIR,—I desire to call attention to an article by Dr. W. P. Healy to which reference is made in the *Epitome* of July 5th (para. 20). Writing in the *New York State Journal of Medicine* of February 15th, under the title "Factors that influence prognosis and end-results in uterine cancer," this author states that Broders of the Mayo Clinic groups uterine cancers according to their different cell types in four grades, and compares the results of surgical and of radiation treatment according to the grade of tumour. In Grade I he places those tumours "which represent the adult highly differentiated type of epidermoid cancer cell," and in Grade IV those tumours "which are very cellular and made up of completely undifferentiated embryonal or anaplastic cells." Grades II and III are intermediate between Grades I and IV in degree of cellular differentiation and evidences of anaplasia. Dr. Healy points out that the malignancy of the tumour varies with the stage of development of the cell; the higher the stage of development the less is the malignancy, and the lower the type of cell development the higher is the malignancy.

These observations are, I think, generally admitted to be true, but his further observations will probably come as a surprise to a great number of medical practitioners—namely, "that the degree of radio-sensitivity of the epidermoid cancers of the cervix varies directly with the cell type, Grade I being the most radio-resistant and Grade IV the most radio-sensitive," an observation which has a most important bearing upon the question of treatment, which is borne out by the statistics and end-results which he quotes. In cancer of the cervix in Grade IV, the most malignant type, when treated surgically by hysterectomy, only 9.5 per cent. of the patients remained well after five years, whereas of those treated by radiation 66 per cent. remained well after five years. Cancer of the corpus uteri he also differentiates into four grades, according to cell type and structure. He states that those in Grade I were least malignant and were the most readily cured by any form of efficient therapy; Grade IV cases were the most malignant, and at the same time the most radio-sensitive, histologically resembling closely the anaplastic Grade IV of cervix cancers. These cases of cancer of the corpus under surgical treatment gave uniformly bad results, not one of the patients in Mahle's report from the Mayo Clinic having survived five years, whereas under radiotherapy 50 per cent. of the patients with Grade IV corpus cancer were alive and well at the end of five years. In advanced cases of all grades which were treated by radiotherapy 23 per cent. of the patients were still alive at the end of five years, though all these cases were hopeless from a surgical point of view when first seen.

It is remarkable in view of these statistics how few cases of uterine cancer are treated by radiation in this country, when compared with the enormous number treated surgically; the only reason is apparently that the beneficial effects of radiotherapy have not been made sufficiently evident in the medical literature of this country. I have treated a large number of cases of uterine cancer by means of radiation with success, but I must admit that I had no idea that the comparison between surgery and radiotherapy was so heavily in favour of the latter.—I am, etc.,

London, W.1, July 5th. CHRISTOPHER KEMPSTER.

X-RAY TREATMENT OF TONSILS.

SIR,—In reply to Dr. Webster's letter (June 28th, p. 1197) regarding the enucleation of tonsils by diathermy, I certainly had no wish to make disparaging remarks about *x*-radiation in general. Surely, however, such appreciation of *x*-ray treatment may be accompanied by an acknowledgment of its limitations. My statement in "Destruction of tonsils by diathermy" (*British Medical Journal*, June 14th) reads:

> "*x* rays and radium cause the tonsils and lymphoid tissue to diminish in size, but the remaining shrunken fibrous tonsil may continue to serve as a focus of infection."

Further it was suggested that haemolytic streptococci and other pathogenic organisms are often found afterwards unaffected by such treatment. Thirdly, there was the possibility of *x*-ray dermatitis and damage to the thyroid-parathyroid apparatus. Dr. Webster tells us that he is prepared to repeat a 50 per cent. erythema dose twice weekly, as this cannot possibly lead to dermatitis. My own experience of twelve years' *x*-ray therapy does not agree, as I have seen *x*-ray dermatitis develop with still smaller dosage. Dr. Webster possibly ignores the effect of secondary *x*-radiation when he states that by his technique *x* rays cannot possibly reach the thyroid and parathyroid structures.

With regard to the second and pathological question, it is quite correct that haemolytic streptococci are occasionally located in apparently healthy throats. So are diphtheria bacilli; but surely it is at least desirable to eliminate them, especially when virulent specimens are detected. I am assured by my pathologist friend Dr. Creed that the suggestion that the tonsils are part of a normal antibody laboratory is sketchy in the extreme, since no authority has ever discovered where antibodies are formed normally. The spleen probably plays a great part. It is still more unlikely that organisms in freely draining tonsillar crypts act as a stimulation of antibody production. Further, even if, as Dr. Webster states, *x* rays cause a reduction in the number of organisms in the tonsil crypts, surely this would by his very theory reduce the antibody stimulators.

In my opinion the greatest objection to the *x*-ray treatment of tonsils lies in the very shrinkage Dr. Webster mentions. The extensive invagination of surface area produces innumerable pockets or crypts. As a result of the diathermy enucleation, however, we are left with a soft glassy scar with practically no contraction of tissue.—I am, etc.,

Putney Hill, S.W.15, July 7th. WARNER COLLINS.

VILLAGE SETTLEMENTS IN THE AFTER-CARE OF TUBERCULOSIS.

SIR,—In the review of the report of the employment committee of the Joint Tuberculosis Council (*Journal*, June 28th, p. 1183) I notice the following passage: "An important criticism of village settlements is that they cater for so few people." I hope you will forgive me for writing to point out what a curious criticism this is. The only reason why village settlements have so far only catered for a few people is because no such settlement has yet had enough capital. As the committee indicates, the local authorities originally responsible for the inhabitants of a village settlement contribute nothing towards the capital expenses involved. If they did—and I have already suggested a manner in which they might conveniently be empowered to do so—it would be found that many more people would be "catered for" in village settlements.

The committee's suggestion that persons "settled" should be "unsettled" after a few years seems to me to show a complete misunderstanding of the foundation of village settlements. They are not intended to "harden off" early cases, but to provide permanently for moderately advanced cases which have been rendered quiescent. Surely the committee is aware that in such cases quiescence is not a permanent condition, and that exacerbation would follow a return to the outside world, especially as the prospects of obtaining suitable employment are, on the committee's own showing, practically nil?

One further point: the result of the appeal to employers was the conclusion that "ordinary industry can contribute nothing of importance to a solution of the problem at issue." Yet the committee, later in the same report, "expresses the view that the primary aim of all schemes for care and after-care should be to increase the proportion of cases that can enter ordinary industry!" Comment is superfluous.

The committee's report proves, more clearly than it proves anything else: (1) that ordinary industry will not absorb ex-sanatorium patients, and (2) that only in village settlements can such persons be sure of permanent employment. Is it not evident, therefore, that until there are enough village settlements the whole problem of tubercu-

losis will remain unsolved? "Early" cases avoid discovery because they fear economic disaster. Remove that fear by means of village settlements and surely the proportion of "early" notifications will increase. One thing is certain: until that fear is removed we shall make little progress in combating tuberculosis.—I am, etc.,

P. C. VARRIER-JONES,
July 8th. Medical Director, Papworth Village Settlement.

AN IMPERIAL MEDICO-POLITICAL CONFERENCE.

SIR,—It is now common knowledge that the British Medical Association will be celebrating in 1932 the centenary of its birth. For the past twenty-eight years there have been held annually in the United Kingdom meetings of representatives, but the problems discussed have been almost entirely confined to those affecting the medico-political interests of the members resident there. Although representatives from overseas do to some extent attend, this annual opportunity for a short medico-political conference among themselves and with those working at the headquarters of the Association has never been taken advantage of.

It has become now quite the usual thing for the British Government of the day to call into conference representatives of the Dominions and of the Colonies when there are discussed questions that profoundly affect the future of the Empire and other nations, many of which have a medico-political bearing. At Geneva the League of Nations has developed a section that deals with social services, and consequently impinges on, and eventually controls, matters in which members of the British medical profession are deeply interested. Wireless, air mails, and rapid means of transit have brought all much closer together; disease is less localized now than it used to be. Medico-political activities can no longer be conducted in isolation.

Does not the centenary in 1932 provide a similar opportunity for more closely linking up the Association at home and the Association overseas, for purposes of education, consultation, and protection, thus allowing it to take in Imperial health questions generally that intimate consultative and co-operative part which it takes locally in all parts of the Empire? We have a Dominion Committee, and it does good work. But in 1900 a medico-political committee for Great Britain was sufficient for all purposes; now it is only a small part of the intricate machinery developed. Health insurance problems, State and voluntary hospital problems, maternity service problems, general medical service problems, drug traffic problems—all have their peculiar setting in relation to the part of the Empire concerned. On all these and other matters exchange of experience would be invaluable.

The human tendency is for those with a common interest to come together, and thus we are faced with innumerable kaleidoscopic groupings. This is all to the good in so far as central bargaining is concerned. But if those who have to face and to deal with such trained and experienced combinations are themselves at the best only individual units, then their defeat becomes as easy as that of an undisciplined mob. We at home should recognize the advantage of personal contact with the stimulating influence of colleagues who live under freer conditions. We are still far too provincial and introspective in our outlook, our interests, and our actions. Such a conference—especially if repeated at reasonable intervals—would help to alter all this and result in good to those we who live here desire to help.

The Sections at the Annual Meeting in 1932 could be made to acquire a more Imperial aspect by a suitable choice of subjects for papers and debate. But unless the individuality and freedom of medicine has been secured all discussion of scientific subjects will be academic and conducted in shackles.

There is time for our overseas members to consider the proposal and to express their views.—I am, etc.,

Hove, Sussex, July 10th. E. ROWLAND FOTHERGILL.

Medical Notes in Parliament.

[FROM OUR PARLIAMENTARY CORRESPONDENT.]

THE House of Lords has this week decided to insist on its amendment to the Coal Mines Bill, which would permit the working of a ninety-hour fortnight in mines. The House of Commons debated the Scottish Estimates, Imperial Trade Policy, and a motion to authorize an increase of £10,000,000 in the Unemployment Insurance Fund. The Finance Bill was again considered on report. The Housing (Scotland) Bill passed through report and was read a third time in the House of Commons. In the House of Lords the Housing (No. 2) Bill was read a second time.

The Mental Treatment Act (1930) received the Royal Assent on July 10th.

In the House of Commons, on July 15th, discussion arose on the position of opticians under the national health insurance scheme, and a statement was made by Mr. Greenwood.

Mr. Greenwood states that an interim report from the Committee on Maternal Mortality will be published before the end of the month.

Scottish Department of Health.

The House of Commons, on July 14th, considered in committee a vote to complete the sum required for the salaries and expenses of the Department of Health for Scotland.

Mr. W. ADAMSON, in moving the vote, said that in 1929 the birth rate in Scotland was 19.02 per 1,000 of the population. Both the birth rate and the actual number of births were lower last year than in any year since compulsory registration was introduced in 1885. The death rate was 14.5 per 1,000, which was slightly higher than in 1928. This was largely, if not altogether, attributable to the epidemic of influenza in the first quarter of 1929. Respiratory diseases during that epidemic had an adverse effect on the infantile mortality rate, which was 88.8 per 1,000 in 1929. This was, however, lower than the rate for any year except 1923 and 1928.

Maternal Mortality in Scotland.

Scotland was still in an unenviable position with regard to maternal mortality, the rate for 1929 being 6.9 per 1,000 persons, compared with 7 for the preceding year. The rate had varied very little since the introduction of schemes of maternity and child welfare, and showed no marked tendency to decline. The matter was continually occupying the attention of the Department of Health, the local authorities, and others engaged in medical administration. Investigations were now being made in Scotland into the deaths of married women during pregnancy or within four weeks of the termination of pregnancy. While the numbers so far investigated were not sufficient on which to base definite conclusions, there was throughout a quite definite indication of the need of providing more complete medical supervision and care of women during pregnancy. To that end it was hoped, with the present organization of the health services under the Act of 1929, that an effort would be made to secure an adequate ante-natal service; but for the best results they must look to the mothers themselves to co-operate by making a fuller use of the services provided. This would probably have to be done by stimulating their interest in these services and educating them as to their value.

Tuberculosis.

With regard to tuberculosis the picture was more encouraging. The death rate in 1929 from all forms of tuberculosis was 94 per 1,000, the lowest yet recorded in Scotland. It was 3 per 1,000 lower than the rate in 1928, which up to that time had been the lowest recorded figure. In 1929 4,579 persons died from tuberculosis, compared with 6,326 in 1919. Although respiratory tuberculosis shared in the high mortality of the first quarter of last year, the death rate for the year was down, and but for the abnormal weather in the first quarter the decrease in the number of deaths would have been even more substantial. Although tuberculosis still accounted for many deaths it was hoped that the continuance of the intensive campaign against the disease, aided by improved methods of diagnosis and a greater facility for institutional treatment, would, ere long, secure that tuberculosis would be classed among the less deadly ailments of humanity.

Sickness among the Insured.

The amount expended by the approved societies on sickness and disablement benefit still kept abnormally high. In 1929 £1,924,000 was spent—an increase of £200,000 over 1928. The epidemic of influenza in the early part of the year accounted for some part of the increased expenditure, but, after making allowance for that, and for the slightly increased number of insured persons at risk, there remained a considerable part of the increase for which no explanation was available. The Department continued to give the matter its closest attention, and had been in conference regarding it with representatives of the approved societies and a

special committee of the Insurance Acts Committee of the British Medical Association. The Department, in addition, had constantly before it the importance of determining, if possible, the causes from which the demand on sickness funds arose. One difficulty was that it had not been possible hitherto to prepare and publish accurate statistical information regarding the nature and extent of incapacitating illnesses among the insured population. The Department of Health was now in a position to remedy this defect. On July 1st it put into operation a scheme for the collection of complete and trustworthy data from the approved societies, from which might be compiled statistical records giving, *inter alia*, the incidence of the various incapacitating diseases and their duration, not only for insured persons generally, but for other groups of insured persons, arranged according to area of residence, occupation, age, etc.; also the extent to which individual medical practitioners were granting certificates of incapacity for work. The scheme was considered recently at a conference between the Department and representatives of the larger approved societies in Scotland. Those representatives approved the principle of the scheme, and promised to co-operate in making it as complete a success as possible. Incidentally it was hoped that the more definite statistics, when published, would be of great value to the local authorities in their administration of the health services in their areas.

With regard to the inhabitants of St. Kilda, it had been decided to evacuate them, and the question of their destination was receiving attention. Considerable improvement continued to be effected in the purity of the milk supply of Scotland. That was in large measure due to the efforts of producers to attain a higher standard and to the increased attention given by local authorities to the inspection of dairy cattle and the structural and sanitary condition of dairy farms. The Lanarkshire milk investigation, undertaken in the early part of the year, to ascertain the effect on the growth, height, and weight of school children by supplying them with an extra ration of milk, showed there was every sign that there had been an improvement in the children who received the milk, as compared with those who had not received it. The Empire Marketing Board had promised a grant for an investigation into the incidence of tuberculosis in milk, to be continued for a period of two years, and to be carried out by the Department of Health in co-operation with the health authorities of Aberdeen, Dundee, Edinburgh, and Glasgow.

With regard to housing, according to the latest returns there had been completed, at May 31st last, under all forms of State assistance in Scotland, 110,136 houses. These probably accommodated about 425,000 people, or perhaps one-ninth of the working-class population in Scotland. But at least another 100,000 houses were required before housing conditions could be regarded as reasonably satisfactory. The Government were carrying through special legislation dealing with slum clearance, and when the new bill became law he trusted there would be a great forward movement by the local authorities.

Debate.

Sir J. GILMOUR expressed the hope that the steps being taken by local authorities to set up abattoirs would lead to greater facilities for meat inspection, and that thus gradually the scourge of tuberculosis among cattle would be eliminated. The problem carried with it the difficulty of obtaining the good will and co-operation of those in the industry, and it should be treated as a matter of education and administration. The more people that could be induced to visit the research stations the better.

Mr. MACPHERSON, speaking on the Highlands and Islands Medical Service, said that if this Government had done nothing else, it had done one good thing in promising to increase the annual grant to £72,000. It was a variable grant, and so long as the Government was in office it was more or less pledged to keep the grant at a figure high enough to meet the various needs of the community. He knew the life of the Highland doctor in the old days very well indeed. If ever there was a hero in the world it was the Highland doctor. On many a stormy night in winter he would have to go miles, up hill and down dale, and very often, at the end of it, the journey would have cost him six or seven hours, and he would probably get half a crown, or nothing at all, for going there. It was a great joy to those interested in the Highlands to find that men of that calibre and quality could now be guaranteed, in any case, a livelihood. The grant, introduced in 1911, had justified itself. He impressed on the Under Secretary for Health the need of developing things, such as telephones, in doctors' houses, the housing of doctors, and of assisting nursing associations. He drew particular attention to the nursing associations, which had been formed through the willingness of the voluntary workers and the local inhabitants to help themselves gradually to acquire nurses in the different districts. As he understood it, the voluntary associations did not desire to be dependent on State grants entirely. They wished that, in necessitous areas, the State should stand by and, where the need was greatest, come forward and assist in this very deserving work.

Dr. ELLIOT said that the public health of Scotland seemed to be improving. The attack on tuberculosis continued to give an increasing yield. It took forty years to halve the death rate from tuberculosis after 1870. Afterwards it was halved again in twenty years. Let them see if they could not halve it a third time in ten years. Many water-borne diseases had practically been conquered; food diseases were in the way of being conquered; but air-borne diseases were still completely unsubdued. Figures pointed strongly to the fact that the fundamental resistance of the individual to disease had not been safeguarded where it would give the best results. When it was not safeguarded it would lead to breakdown in adolescence or adult life. All efforts at administration were of no use unless they met with a corresponding good will among the people, such as a willingness to purchase and pay for clean milk. The milk experiments in Lanarkshire, and other such experiments, would foster a health consciousness among the people. Until they had got sound children between the ages of 1 and 5 years the children of 14 and 15 must take a secondary place. Since we had turned so largely towards preserved foods, extract foods, and refined foods of one kind and another, the necessity for studying these things scientifically stood out in almost every section of the report. Since 1920 the Poor Law authorities in Scotland had spent £10,000,000 on the purchase of food without, so far as he knew, any real examination into the principles which governed dietetics in the modern State. The difficulties before them were very great, but there was no reason to suppose that a scientific examination into the feeding, both of the younger and of the older people, would not give most valuable results. The physical condition of our people was one of the chief concerns of the Department of Health.

Mr. JOHNSTON, replying to the debate, referred to his recent visit to St. Kilda. He said that the condition under which the people there were living was almost incredible. It was famine. There was an actual shortage of food, and, but for the devoted service and labour of the Queen's nurse, Heaven knew what tragedies would have occurred. The Lanarkshire milk experiment with 10,000 school children would be of interest not only to Scotland, but to the world. It would possibly do more to assist agriculture than any step which had been taken for a long time if it could be proved beyond all doubt that a ration of milk to the school child would raise its weight, and even its height, and would better its health in every way. By organizing the milk supply through the local authority they would, later on, save untold millions of public expenditure. The Secretary of State proposed, at an early date, when the public assistance committees had got on their feet, to have a discussion with some of them to see how far they could secure the adoption of a more reasonable scale, at least so far as the children were concerned.

The vote was agreed to.

Road Traffic Bill.

The Road Traffic Bill was considered by the House of Commons on report on July 10th. Clause 15 deals with the punishment of persons driving motor vehicles when under influence of drink or drugs. Dr. VERNON DAVIES urged that the drugs should be specified. He asked whether a man would be liable to prosecution under this clause if he took a heavy dose of quinine and deafness resulted. The inquiry was not answered, but the clause was altered by substituting "or a drug" in place of "or drugs."

Sir WILLIAM BRASS moved to provide that a person arrested under this section should be entitled to be examined by his own or an independent medical man.

Sir WILLIAM JOWETT said the ordinary practice was that if a person charged with an offence of drunkenness wished an examination to be made by a medical expert of his selection that opportunity was given him. The Government would see that the police authorities were properly circularized and reminded of this practice, and it would be pointed out to them that the Government thought it desirable that the practice should be continued.

Sir William Brass withdrew his amendment.

On Clause 35—obligation of owners of motor vehicles to hold insurance policies or other security against third-party risks—Major HILLS moved to omit Subsection 2. This proposes to confer a right on hospitals to receive a payment of £25 each for treating persons injured in certain cases by motor vehicles. He agreed that the burden of treating motor accidents was breaking down the hospitals, but said it should be met by the imposition of an extra penny on each motorist's licence.

Mr. HERBERT MORRISON said he proposed to leave this to a free vote of the House. Personally, he took the view that the scramble of the voluntary hospitals for voluntary contributions was a degrading business. The subsection bristled with difficulties, and he would vote against it.

Dr. MORRIS-JONES said the House would be disappointed with the Minister's speech.

Dr. FORGAN said the voluntary system of conducting hospitals was out of date, and the great majority of the hospitals were nearly bankrupt. The financial support which the bill would bring them was slight.

After further discussion Major HILLS withdrew his amendment, and the subsection remains part of the bill, discussion of which was adjourned.

Preservatives in Cream.—Mr. GREENWOOD told Mr. Richard Russell, on July 10th, that he had carefully considered representations made to him by those engaged in the production and distribution of cream as to the effect of the Order prohibiting the use of preservatives in cream upon the industry, but was not prepared to suspend or modify them. A large number of efficient firms had adapted themselves to the new regulations, and it was possible for others to do so.

Spectacles for Insured Persons.—Mr. GREENWOOD told Mr. Middleton, on July 10th, that the fixing of a scale of charges for the supply of optical appliances to insured persons was a matter for agreement and negotiation between approved societies and opticians. Negotiations had been in progress between the Joint Council of Qualified Opticians and representatives of societies, and a scale of charges had been agreed upon. The societies were alive to the importance of protecting their members against unreasonable charges on the part of opticians, and under the regulations governing administration of benefit they had full power to do so.

Inspection of Factories.—Mr. SHORT, replying to Mr. Gould on July 14th, said that the standard of inspection now aimed at under the Factory and Workshops Act was that recommended by the recent departmental committee on the factory inspectorate. It recommended, further, that works coming under certain codes of regulations should be visited every quarter. This standard could not be secured with the present staff, but it should be possible to conform to it when the large increase recently sanctioned by the Government had been recruited.

Blind Persons.—Mr. GREENWOOD told Sir N. Grattan-Doyle, on July 14th, that complete figures were not available of the total cost of administering the Blind Persons Act, 1920, up to March 31st last. The total number of registered blind persons in England and Wales was 52,727 on March 31st, 1929. On the same date there were 258 blind persons up to the age of 5 in England and Wales; 2,438 from 5 to 16; 1,623 from 16 to 21; 3,288 from 21 to 30; 4,716 from 30 to 40; and 5,897 from 40 to 50; and 20,149 between the ages of 50 and 70.

Universities and Colleges.

UNIVERSITY OF LONDON.

UNIVERSITY COLLEGE.

THE following awards have been made in the Faculty of Medical Sciences:

Entrance Scholarship: H. A. Oatley. Bayliss-Starling Memorial Scholarship: R. A. Kekwick. Sharpey Scholarship (physiology): F. G. Young.

Anatomy and Embryology: Senior Class (prize equivalent to gold medal), G. Qvist; Junior Class (silver medal), J. H. Kellgren; Junior Class (histology and embryology—prize equivalent to silver medal), K. C. Eden.

Physiology: Senior Class (gold medal), A. d'Souza; Junior Class (prize equivalent to silver medal), K. C. Eden.

Organic and Applied Chemistry: General Course (prize equivalent to silver medal), A. G. Hounslow.

Pharmacology: Prize equivalent to silver medal, G. Qvist.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE.

The following candidates have been approved at the examination indicated:

ACADEMIC DIPLOMA IN BACTERIOLOGY.—Y. B. Abdoosh, H. R. Aggarwal, C. G. Anderson, J. G. C. Campbell, J. Carmichael, F. P. Coyne, S. R. Pandit, R. S. Twigg.

Division of Tropical Medicine and Hygiene.

The following have successfully passed the school examination at the termination of the eighty-eighth term (February-July):

*A. B. Cook (Duncan medal), *T. F. Arderson, *W. K. Connell, *D. R. McPherson, *E. N. O'Neill, *C. E. Roberts, *R. G. Spink, *D. E. Stewart, *M. V. N. Sudds, *H. G. Timbres, C. A. Alvarado, E. Burton, G. Q. Chance, P. J. Cowin, B. P. Dutt, M. A. Gaffar, D. R. Griffith, L. R. Khan, A. H. H. El Kordi, E. M. Lourie, F. H. McCay, F. Marsh, E. C. W. Maxwell, D. Murray, T. H. Nolan, P. K. Rao, R. Shelley, H. M. Soar, T. W. Stephens, B. A. Taylor, W. F. O. Taylor, S. E. Theis, G. M. Tullidge, H. B. C. Wallace, E. M. Wijerama, W. H. Willis, E. D. B. Wolfe, K. Wood-Martin.

* Passed with distinction.

UNIVERSITY OF LIVERPOOL.

A DEGREE ceremony took place in St. George's Hall on July 5th. The following medical degrees were conferred:

M.D.—W. E. A. Burton, R. L. Corlett, Gwyneth Griffith, Muriel B. Hall, A. J. Hawe, E. W. Jones, Edna E. Mawson.

M.B., CH.B.—[1 3 4] G. W. Causey, [2 3] Marjorie E. Birch, [2 3] Honora J. Twomey.

The following have been approved at the examinations indicated:

M.B., CH.B.—*Part III (1923 Regulations)*: A. L. Beresford, I. Kossew, E. H. Williams; *Part I*, M. L. Kaufman; *Part II*, R. Fairhurst, R. Kossew. *Part B (1924 Regulations)*: L. G. Anderson, A. Blumfield, W. N. Chalmers, J. W. Cheetham, D. H. Collins, A. Curtis, W. Dodd, P. P. Fox, M. Glynn-Morris, D. O. Hughes, V. S. Hughes-Davies, A. T. Jones, R. P. Kemp, F. R. Kitchin, J. L. Mewton, J. Polonsky, W. J. Poole, M. Solomon, T. P. Twomey, R. Wright; *Part A*, F. J. Burke, H. T. Cank, [6 7] W. J. Chisnall, L. M. Crooks, [5 6 7] W. S. Diggle, H. G. Evans, [5] I. Harris, J. H. Hughes, [7] T. L. Hughes, E. R. Jammy, [7] J. A. Jones, O. V. Jones, [7] W. W. Laughland, [6 7] T. E. Lennon, [7] H. F. Loewenthal, [7] A. J. Martinez, [7] D. F. Morgan, P. B. Moroney, A. L. Potter, [7] J. Sytner, R. H. Thewlis, J. V. Tollington, Winifred Wallis, A. R. Williams, A. Wynroe. Passed in separate subjects: F. C. Angior (forensic medicine and toxicology, pharmacology and general therapeutics), Mary F. Lacey (pharmacology and general therapeutics).

D.P.H.—*Part I*: A. Ashworth, Elizabeth M. Harding, R. Krishna.

DIPLOMA IN TROPICAL MEDICINE.—K. C. McKenzie.

DIPLOMA IN TROPICAL HYGIENE.—G. R. Baxter, T. T. M. Chen, J. H. Dobbin, R. A. Heatley, G. B. McHutchison, E. S. R. Menon, C. K. Row, T. Wilson.

[1] First-class honours.
[2] Second-class honours.
[3] Distinction in surgery.
[4] Distinction in obstetrics and gynaecology.
[5] Distinction in forensic medicine and toxicology.
[6] Distinction in public health.
[7] Distinction in pharmacology and general therapeutics.

The following awards have been approved by the Senate:

Ethel Boyce Fellowship in Gynaecology, Dr. T. N. A. Jeffcoate; John W. Garrett International Fellowship in Bacteriology, Dr. R. Krishna; John Rankin Fellowships in Anatomy (for one year), Dr. J. A. Martinez and Dr. N. W. Roberts; Robert Gee Fellowship in Human Anatomy, Dr. M. J. Pennett-Jones; Holt Fellowship in Pathology, Dr. J. Libman; Holt Fellowship in Physiology, Dr. R. Doyle; Johnston Colonial Fellowship in Biochemistry, Dr. R. W. Brookfield; Thelwall Thomas Fellowship in Surgical Pathology, Dr. L. Findlay; University Graduate Scholarship, W. S. Diggle; Samuel's Memorial Scholarship (in Medicine), Dr. E. W. Jones; Samuels Memorial Scholarship (in Surgery), Dr. J. C. Ross; Samuel's Memorial Scholarship (in Obstetrics and Gynaecology), Dr. M. M. Datnow; John Rankin Exhibition in Practical Anatomy, divided between Freda B. Bannister and C. H. Stewart-Hess; Margaret Bryce Smith Scholarship (renewal for a fourth year), A. S. Kerr; Clinical School Exhibition, G. W. Causey; Derby Exhibition, G. W. Causey; *proxime accessit*, Marjorie E. Birch.

UNIVERSITY OF SHEFFIELD.

DR. JOHN RENNIE, D.P.H., medical officer of health for the city of Sheffield, has been appointed Professor of Public Health, in place of the late Professor F. E. Wynne.

The following candidates have been approved at the examination indicated:

FINAL M.B., CH.B.—K. G. A. Barlow, M. B. Hallam, F. Hudson, Constance N. Jenkinson, W. H. B. Moore, Ethel H. Waddy.

UNIVERSITY OF ST. ANDREWS.

THE Senatus of St. Andrews University proposes to confer the honorary degree of LL.D. on Emeritus Professor J. A. Kynoch in October. He was vice-president of the Obstetrical Section of the British Medical Association meetings in 1910 and 1914.

NATIONAL UNIVERSITY OF IRELAND.

UNIVERSITY COLLEGE, DUBLIN.

THE following candidates have been approved at the examinations indicated:

M.D.—C. Bastible, J. O'Connor, H. Quinlan.

FINAL M.B., B.CH., B.A.O.—*T. C. J. O'Connell, *M. J. Mullen, †Patricia M. J. Daly, †P. J. Sinnott, †J. J. P. Ferguson, M. J. Cotter, M. F. Daly, J. J. Godson, C. A. Macken, P. J. McManus, A. P. Madigan, P. J. Murphy, J. G. O'Brien.

D.P.H.—*Part I*: Bridget Crawford, J. C. Liddy. *Part II*: †C. Bastible, M. Kirby, Mary F. Moloney, J. H. O'Neill.

* First-class honours. † Second-class honours.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

A QUARTERLY Council meeting was held on July 10th, when the President, Lord Moynihan, was in the chair.

Election to Council.

The President stated that at the recent election of three Fellows into the Council in the vacancies occasioned by the retirement in rotation of Mr. R. P. Rowlands, Sir Percy Sargent, and Mr. Victor Bonney, the three retiring members were re-elected.

Sir Percy Sargent, Mr. Victor Bonney, and Mr. R. P. Rowlands were introduced and took their seats in the Council.

The late Sir Anthony Bowlby.

Mr. L. B. Rawling, accompanied by Lady Bowlby and Sir Anthony H. N. Bowlby and Miss Bowlby, presented, on behalf of the medical staff of St. Bartholomew's Hospital, a copy by Dorofield Hardy of Sir William Llewellyn's portrait of the late Sir Anthony Bowlby. The Council accepted the portrait with appreciative thanks. The President also stated that a silver tablet in memory of the late Sir Anthony Bowlby, presented by some American surgeons who had been associated with him during the war, was unveiled in the position assigned it in the Inner Hall.

Diplomas.

Diplomas of Membership were granted to two candidates and the diploma of Fellowship was granted to Mr. Donald Spiers Montenegle Barlow, these candidates having complied with the by-laws of the College.

Licences in Dental Surgery were granted to 33 candidates.

Diplomas were granted jointly with the Royal College of Physicians: In Psychological Medicine to 10 candidates. In Laryngology and Otology to 17 candidates.

Fellowship Examination.

A report was read from the Board of Examiners in Anatomy and Physiology for the Fellowship stating that at the examination concluded on June 14th, 158 candidates were examined, of whom 54 were approved and 104 rejected. The report from the Board also announced the award of the Hallett Prize for the examination concluded on June 14th to George Qvist of University College Hospital Medical School.

Primary Fellowship Examination in Canada.

The Council appointed the following Assessors, nominated by the Canadian Medical Association for the primary examination for the Fellowship to be held at Montreal on September 2nd, 3rd, and 5th next: Assessor for Anatomy, Professor S. E. Whitnall (McGill University, Montreal); Assessor for Physiology, Professor John Tait (McGill University, Montreal). The examiners sent by the Royal College of Surgeons will be Professor W. Wright and Professor J. Mellanby.

Mr. Edward Grainger Muir, M.R.C.S., of the Middlesex Hospital, who passed the Final Fellowship in June, 1929, but has not reached the age qualification for the diploma, was appointed Bernhard Baron Research Scholar, the subject of his research to be the pathology of the prostate.

Appointment of Librarian.

Mr. W. R. Le Fanu, M.A., was appointed Librarian from October 1st next.

Plarr's Lives of the Fellows.

Sir D'Arcy Power, the honorary librarian, presented the two volumes of Plarr's *Lives of the Fellows*. The best thanks of the Council were given to Sir D'Arcy Power, Mr. W. G. Spencer, and Mr. G. E. Gask for their services in revising and preparing this work for publication. The volumes can be purchased from Messrs. John Wright & Sons for two guineas (cloth) or three guineas (leather).

Lister Memorial Lecture.

The President reported that the Lister Memorial Lecture on "Neuro-hypophyseal Mechanisms from the Clinical Standpoint" was delivered by Professor Harvey Cushing on July 9th, and that he had presented to him the Lister Medal.

Lecturers.

The Council elected the following Professors and Lecturers for the ensuing year;

Hunterian Professors.—Sir Arthur Keith (six lectures on recent advances in human embryology); Victor Bonney (one lecture on the conservative surgery of uterine fibroids (myomectomy)); Harold Robert Dew (one lecture on hydatid disease—some interesting complications); John Basil Hume (one lecture on the pathology of diaphragmatic hernia); James Paterson Ross (one lecture on the treatment of cerebral tumours with radium, with an account of experiments made to study the effects of radium upon cerebral tissue); David Howard Patey (one lecture on the pathological basis of the treatment of varicose veins by injections, and its bearing on the problems of thrombosis); James William Tudor Thomas (one lecture on successful grafting of the cornea in rabbits).

Arris and Gale Lecturers.—Thomas Peel Dunhill, C.M.G. (one lecture on malignant disease of the thyroid gland—the relation of the incidence and spread to its embryology and prognosis); Donald Hunter (one lecture on metabolic diseases of bone); Herbert Henry Woollard (one lecture on the potency of the pharyngeal entoderm).

Erasmus Wilson Lecturers.—Clement Edward Shattock (two demonstrations on pathology); Cecil Pembrey Grey Wakeley (two demonstrations on pathology); David Howard Patey (one demonstration on pathology); Reginald Theobald Payne (one demonstration on pathology).

Arnott Demonstrator.—Sir Arthur Keith (six demonstrations on the contents of the Museum).

Gilbert Blane Medal.

The Secretary reported that the Sir Gilbert Blane Gold Medal for 1930 had been awarded to Surgeon Lieutenant Commander James F. H. Gaussen, M.B., Ch.B., R.N., in respect of the promotion examination, 1930.

Appointment of Representative.

The President was appointed as delegate to the celebration on October 13th, 1930, of the Jubilee of the foundation of Mason Science College and the thirtieth anniversary of the granting of the University of Birmingham charter.

Buckston Browne Dinner.

The Buckston Browne Annual Dinner of Fellows and Members will be held on Thursday, November 13th.

Election of Officers.

The following officers were elected for the ensuing year: President, Lord Moynihan; Vice-Presidents, Mr. C. H. Fagge and Mr. R. P. Rowlands; Physiological Curator, Mr. R. H. Burne; Pathological Curator, Mr. C. F. Beadles; Honorary Curator of Odontological Collection, Sir Frank Colyer; Honorary Curator of Historical Collection, Mr. C. J. S. Thompson.

Obituary.

FRANK E. TAYLOR, M.A., M.Sc., M.D., F.R.C.S., M.R.C.P.

DR. FRANK EDWARD TAYLOR, whose death occurred suddenly on July 1st, was born in Leeds in 1872. He was educated at the Leeds Boys' Modern School and at the Yorkshire College (Victoria University), Leeds, taking the B.A. degree in 1891, after which he entered the medical department of the same college. In 1897 he graduated M.B., Ch.B.Vict., and obtained the diplomas M.R.C.S.Eng. and L.R.C.P. Lond. He held the post of house-surgeon at the Leeds General Infirmary, and then, deciding to specialize in obstetrics and gynaecology, he obtained resident appointments in these branches in Leeds and London, after which he matriculated at the University of Berlin in 1899. Since the Boer war was in progress he joined the South African Field Force as civil surgeon, and was awarded the medal and three clasps for his services. On his return from this campaign Dr. Taylor further studied his chosen specialty and added to his qualifications, taking the F.R.C.S.Eng. in 1903, graduating M.B., B.S.Lond. in 1904, and becoming M.R.C.P.Lond. in 1905. In 1906 he proceeded M.D.Lond., obtained the diploma D.P.H.Camb., and graduated M.A. and M.Sc. at Leeds. He was then appointed gynaecologist to the North-West London and Hampstead General Hospital, the St. Marylebone General Hospital, and the Eastern Dispensary.

Dr. Taylor's career seemed now assured, but a period of ill-health followed, compelling him to relinquish his gynaecological work in 1912 and maintaining its hold upon him for the remainder of his life. Nevertheless he refused to give in, and having been appointed lecturer in bacteriology at King's College, London, in 1907, thereafter devoted himself to teaching and research in bacteriology and pathology. In addition to his King's College appointment, he acted for some years as pathologist to the Royal Westminster Ophthalmic Hospital, and, during the war, to the Lewisham War Hospital; he had recently been in charge of the vaccine laboratory of the Royal Herbert Hospital.

Frank Taylor was an excellent teacher; he possessed considerable literary ability and originality, and was the author of numerous papers. These in the earlier part of his career were mainly gynaecological, but later on he turned to pathological subjects, and published numerous investigations on the Arneth blood count, vaccines, the absorption test, mycological tests for sugars, Vincent's angina and fusospirillary peridental gingivitis, the *Diplobacillus liquefaciens* of Petit, and many other subjects. For many years he was an examiner on the Central Midwives Board and an occasional contributor to the *British Medical Journal*. He leaves a widow, but no family.

The sudden and untimely death of DR. ALEXANDER NICHOLAS ROSS, on July 5th, came as a great shock to the members of the medical profession on Tees-side. Born in Ross-shire in 1880, he received his early education at the Royal Academy, Tain. His first interest was engineering, but after about a year of study in Glasgow he forsook this subject for medicine, and graduated M.B., Ch.B. at Aberdeen in 1904. He then assisted his brother, who was in practice in West Hartlepool; after two years there he spent a year in South Africa as an assistant. In 1908 he settled in Stockton-on-Tees, and built up a very large practice. He was an honorary physician on the staff of the Stockton and Thornaby Hospital, and a member of the British Medical Association, being chairman of the Stockton Division for two years. He was also a member of the Rotary Club.

A colleague writes: Ross was one of the most straightforward of men and of high ideals. Of most kindly and cheerful disposition, he was held in the greatest esteem by all his colleagues. He never spared himself in his work, and brought great comfort and cheer to his many patients. He gave the same self-sacrificing care to everybody. Undoubtedly he overworked himself; he left his surgery on the evening of July 1st to go home to bed with pneumonia, from which he died on the following Saturday morning. His was, in truth, a life devoted to his fellow men. The deepest sympathy is felt for his widow and two sons, the elder of whom enters Cambridge this year to study medicine.

DR. GAVIN B. CLARK, who died at Hampstead on July 5th at the age of 83, was a prominent political figure in the eighties and nineties. After taking the M.D. and F.R.C.S.Ed., he travelled for some years and then settled in practice in South London. But socialistic ideals early attracted him, and in 1885 he was elected M.P. for Caithness as an independent member, though he practically always voted with the radical wing of the Liberal party. Home Rule for Ireland and the Crofters Acts were at this time the measures which most particularly claimed his attention, and he was an ardent supporter

of women's suffrage, progressive self-government for India, and international peace. Dr. Clark was early associated with South Africa, and in the eighties was appointed Consul-General for the South African Republic, a post he resigned some two years before the South African war. With Mr. Lloyd George and other Liberals he took the unpopular view of the war, and was one of the most bitterly attacked "Pro-Boers" in the country. After the loss of his seat in the General Election of 1900 he did not endeavour again to enter Parliament, though he was persuaded to fight in the interests of Labour against Sir John Pratt at Glasgow in 1918. He found a more effective outlet for his energies in the numerous societies and organizations of which he was a member. Despite his lifelong advocacy of peace Dr. Clark was convinced that the cause of Britain in the great war was just. At the commencement of hostilities he interested himself in the Belgian relief movement, and he played an active part in the Wounded Allies *Relief* Committee, which established hospitals in France and Serbia. For these services he received the Belgian Order of the Crown and the Serbian Order of St. Sava. Dr. Clark was a man of great force of character and wide interests. His sympathies were always with those needing help, and he never lacked courage in espousing an unpopular cause. The Prime Minister writes of him: "He has had a long and very useful life, and his name will always be associated with two great causes, which he served with singular devotion—the Highlands and Peace." Dr. Clark leaves a widow and one son and a daughter (Mrs. W. A. Brend). A younger son, Captain W. B. Clark, R.A.M.C., was killed in the war.

Medical News.

PROFESSOR ARTHUR J. HALL has accepted an invitation from the Medical Association of South Africa (British Medical Association) to read a paper on epidemic encephalitis, before the South Transvaal Branch, during his visit to Johannesburg as the representative of Great Britain at the International Conference on Silicosis.

PRINCE GEORGE will open the new cabinet-making workshop at Papworth Village Settlement on Wednesday, July 23rd, at 2.30 p.m., and subsequently the West Cambridgeshire flower show will be held in the grounds of Papworth Hall.

THE Duke of Connaught, on July 15th, unveiled a bust of the late Mr. Bernhard Baron in the main hall of the Royal Westminster Ophthalmic Hospital. His Royal Highness recalled that Mr. Baron, during the years he spent in England, his adopted country, gave over £2,000,000 to charity.

THE Home Secretary announces that in accordance with a recommendation of the Health Committee of the League of Nations communicated to His Majesty's Government by the Council of the League, an Order in Council has been issued under the Dangerous Drugs Act, 1920, extending Part III of that Act, which provides for the control of morphine, heroin, and cocaine, to di-hydro-morphinone, its salts and any preparation, admixture, extract, or other substance containing any proportion of di-hydro-morphinone. The effect of the Order is that this drug (the trade name for which is dilaudide), its salts, preparations, etc., may not be imported into or exported from the United Kingdom and Northern Ireland without a licence issued by the Secretary of State under the Dangerous Drugs Acts, and, as regards internal control, the Dangerous Drugs (Consolidation) Regulations, 1928, will apply. Dilaudide is not manufactured in this country.

THE Royal Society announces in our advertisement columns that it is prepared to receive applications for a Lawrence Research Studentship to be awarded for one year for research in some subject related to the cause and cure of disease in man and animals. The sum available will not be more than £200, but the Council will be prepared to consider an award to the holder of a stipend from some other source; the total emolument will not exceed £350. Applications must be sent in by October 11th, on forms to be obtained from the assistant secretary, Royal Society, Burlington House, London, W.1.

THE Fellowship of Medicine announces that from July 21st to August 2nd there will be a special course in diseases of infants at the Infants Hospital, Vincent Square, S.W.1, each afternoon from 2 o'clock. In addition to lectures and demonstrations there will be special visits to the United Dairies Pasteurizing Plant, Willesden, and the V.D. Centre, Thavies Inn. From August 5th to 31st a special course in urology will be held at the All Saints' Hospital, Vauxhall Bridge Road, during the afternoons and early evenings, and comprising clinical and cystoscopic demonstrations. From August 11th to 16th a special course in diseases of the chest at the Brompton Hospital will occupy the whole of each day, with demonstrations, lectures, and operations. The general course of the Fellowship continues throughout the month, consisting of attendance at the clinical practice of fifty London special and general hospitals. Programme, tickets, and further details may be obtained from the secretary of the Fellowship, 1, Wimpole Street, W.1.

AN international post-graduate course will be held in Vienna from September 29th to October 12th, occupying the whole of each day, and including lectures and demonstrations on the more important new therapeutic preparations and lines of treatment. Further information may be obtained from the secretary of the International Post-graduate Courses, Dr. A. Kronfeld, Porzellangasse 22, Vienna IX.

AT a quarterly court of the directors of the Society for Relief of Widows and Orphans of Medical Men held on July 9th a total sum of £2,151 5s. was voted in grants to the widows and orphans who are receiving relief for the half-year July 1st to December 31st. Widows over 65 years of age received £37 10s. each, those under 65 £35, and the orphans £25 each. At the present time there are 51 widows and 12 orphans on the books. Relief is only granted to the necessitous widows and orphans of deceased members of the society. Any widow of a member who is left with an income of £125 or under is eligible to such relief as the court of directors think fit to grant her. Membership is open to any registered medical practitioner who at the time of his election is residing within a twenty-mile radius of Charing Cross. The secretary will be pleased to send further particulars to any medical man within that radius who may be desirous of joining the society.

THE first International Congress of Neurology will be held at Berne from August 31st to September 4th, 1931, when the following four subjects will be discussed: (1) diagnosis and treatment of cerebral tumours; (2) anatomy, physiology, and pathology of muscular tone; (3) acute suppurative infections of the nervous system; (4) the role of trauma in the production of nervous symptoms.

THE ninth Roumanian Congress of Oto-rhino-laryngology will be held at the Coltea Hospital, Bucarest, under the presidency of Dr. A. Costiniu, on October 25th and 26th, when the subject for discussion will be radiography in oto-rhino-laryngology, introduced by Drs. I. Tetu, Jovin, and Androescu. Further information can be obtained from the general secretary, Dr. Lazar-Mayersohn, Calea Mosilor 81, Bucarest.

THE first Congress of the International Society of Experimental Phonetics, held at Bonn last month, was attended by nearly 100 persons. A prominent feature of the proceedings was a demonstration of *x*-ray films of the vocal organs during speech by Dr. H. Gutzmann (Berlin); the movements of lips, tongue, uvula, hyoid bone, and larynx were seen with striking clearness. Professor M. Isserlin (Munich) spoke on problems of aphasia, Dr. Kaiser (Amsterdam) described the registration of pathologically altered voices, and Dr. Berger (Münster) described investigations of the Lombard test. Among the exhibits was one from the West End Hospital for Nervous Diseases (London) showing voice records in nervous diseases. Professor Schilling (Freiburg) described an electric method of registering tongue and palate conditions, and Dr. Zwirner (Berlin) showed speech curves from cases of depression. Several papers and demonstrations were concerned with registration by the oscillograph, and the nature of the vowels. Professor E. W. Scripture (Vienna) explained his theory of speech atoms and speech molecules, and Mr. F. Janvrin (London) presented an experimental analysis of a record of verse spoken by John Galsworthy himself. Nearly a dozen papers presented the results of experimental phonetics in linguistic problems. The proceedings of the congress will be published in a volume of about 128 pages, costing 10s. At a meeting of the council it was decided that the membership fee should be 10s. a year, to be sent to the Secretarial Bureau, 73, Welbeck Street, W.1. It was also decided that the following publications should be sent free of charge to the members: *Zeitschrift für Experimentalphonetik*, *Bulletin of the International Society of Experimental Phonetics*, *Bulletin de la Société Internationale de Phonetique Experimentale* and *Sprachneurologische Mitteilungen*.

THE fifth Congress of French-speaking Psycho-analysts was recently held at the Asyle Ste. Anne, Paris, when papers were read by MM. Hesnard and Laforgue on the psychical mechanism of auto-punishment in the psychology of neuroses and psychoses, criminal psychology, and general pathology; by Mme Bonaparte on the prophylaxis of neuroses in children; and by Mme Morgenstern on the place of psycho-analysis in mental hygiene.

Letters, Notes, and Answers.

All communications in regard to editorial business should be addressed to ***The EDITOR, British Medical Journal, British Medical Association House, Tavistock Square, W.C.1.***

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated. Correspondents who wish notice to be taken of their communications should authenticate them with their names, not necessarily for publication.

Authors desiring REPRINTS of their articles published in the *British Medical Journal* must communicate with the Financial Secretary and Business Manager, British Medical Association House, Tavistock Square, W.C.1, on receipt of proofs.

All communications with reference to ADVERTISEMENTS, as well as orders for copies of the *Journal*, should be addressed to the Financial Secretary and Business Manager.

The ***TELEPHONE NUMBERS*** of the British Medical Association and the *British Medical Journal* are *MUSEUM 9861, 9862, 9863,* and *9864* (internal exchange, four lines).

The ***TELEGRAPHIC ADDRESSES*** are:

EDITOR OF THE *BRITISH MEDICAL JOURNAL*, *Aitiology Westcent, London.*

FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate Westcent, London.*

MEDICAL SECRETARY, *Mediscera Westcent, London.*

The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin (telegrams: *Bacillus, Dublin*; telephone: 62550 Dublin), and of the Scottish Office, 7, Drumsheugh Gardens, Edinburgh (telegrams: *Associate, Edinburgh*; telephone 24361 Edinburgh).

QUERIES AND ANSWERS.

DIET IN RHEUMATISM.

DR. GRAHAM GRANT (Gray's Inn, W.C.) writes: We are constantly being asked by elderly patients suffering from recurring attacks of subacute rheumatism what to eat, drink, and avoid, and we are charged with giving conflicting opinions when so consulted. Some medical men advise lemons, others disapprove; some permit beer as a beverage, others hold up their hands in horror (although brewers' labourers do not seem to have rheumatic ailments more than other classes of the community), and endless other instances of divergence can be mentioned, which leave the unfortunate patient with the fear that everything he is eating or drinking may make him worse. Can any of your readers supply me with a dietary which is a safe one without being too ascetic?

CLOTHES MOTHS.

DR. R. E. DRAKE BROCKMAN writes in reply to "H. G.," whose inquiry was printed last week:—An infallible method, which I devised after much loss from the depredations of clothes moths, is as follows: If the clothes are stored in drawers or boxes, get some cheap thin white cloth or linen and have it made into bags, which should be just larger than the drawer or box. Divide the bag into numerous divisions 4 in. wide by sewing across it. Into each of the divisions put a reasonable amount of crude naphthalene and close the ends of the partitions. When complete it looks something like a cork mattress, but, of course, only a small quantity of naphthalene is put in each partition. This mattress of naphthalene should be laid on top of the clothes next to the lid of the box, and will be found a certain protection against moths. I have thus kept my clothes moth-free for over twenty years. Of course, the clothes should be taken out a few days before use and thoroughly aired, if possible in the sun, to rid them of the smell of naphthalene.

CLEANSING OF THE CHALICE.

"MEDICUS" asks if there is any evidence that neglect to wipe the chalice between each participant during the Communion Service may give rise to the transmission of such an infection as pyorrhoea. His own view at present is that, although it would seem cleanly to use a purificator, yet even this is hardly efficient as a means of eliminating risk of infection.

BROMIDROSIS.

"A. A." writes: I should advise "R. B. C." (July 12th, p. 86) to try a thorough and prolonged soaping every night with hot water and biniodide soap (Parke Davis's neko), and then rub liq. formaldehyde sap. (diluted, if necessary, to half or one-third strength) into the wet skin of the soles and between the toes. Suitable diet and a belladonna mixture would discourage sweating. Light socks should be worn, and it is beneficial to go barefoot whenever possible.

INCOME TAX.

Return to United Kingdom.

"G. H. A.," who is at present residing and working outside the United Kingdom, inquires on what basis his earnings would be assessed in this country if he came to reside and work here.

*** The amount of the liability would not be affected by his present earnings abroad; on coming to this country a new basis would be adopted. That basis would be: period to April 5th of the first year, the amount of that year's earnings; second year, the amount of the earnings of the first twelve months' in the United Kingdom; third year, the amount of the earnings of the second year, or of the third year if less; after that, the previous year throughout. This, of course, assumes that "G. H. A." does not buy a share in a practice; in that case the previous profits of that practice would normally determine his liability, but in neither case would his present earnings enter into the calculation.

Succession to Practice: Cash Basis.

"ELM" was assistant to his father in a general practice from December, 1924, to April, 1928, when he took over the practice, for which he is now paying. He is informed that the authorities require the returns to be made on the basis of the bookings of the practice, which would involve heavy labour in preparing the statements and estimating the amount of bad debts.

*** We assume that "Elm" has not included in the cash receipts for the purpose of the income tax statements the cash received for work done prior to April, 1928. In that case the returns have undoubtedly not reflected the full earnings of the practice, but only that portion which has been received as cash. The attitude of the revenue authorities is correct, but perhaps a compromise could be arranged on the basis of revising the calculations to include *all* cash receipts, whether belonging to "Elm" or his father.

Car Allowance.

"V. F. F." was in partnership until September 30th, 1929, was unemployed to January 1st, 1930, and was then an assistant until April 1st, 1930, in a practice in which he acquired a partnership as from that date. What depreciation allowance can be claim in respect of the income earned in these periods?

*** Nothing can now be done as regards the income tax payable in respect of the share in the old practice; depreciation allowance should have been claimed at the time. (2) Strictly the same applies to the three months' employment earnings, though if that liability has not been settled yet, the inspector of taxes will perhaps admit a claim now to wear and tear allowance for the last quarter of the year 1929–30—that is, one-fourth of 20 per cent. of £200=£10. (3) For the year 1930–31 the *new* partnership's wear and tear claim is increased by the addition of "V. F. F.'s" car to those in partnership use, and the increase will be the amount of the 1930–31 claim on his car—that is, 20 per cent. of £160=£32.

LETTERS, NOTES, ETC.

OSTEITIS FIBROSA.

WITH reference to the case of osteitis fibrosa, with initial symptoms resembling rheumatic infection, described by Drs. J. Salisbury Craig and James H. Shearer in the *Journal* of July 5th (p. 9), Dr. J. Tertius Clarke has asked the authors to explain why it was considered that the initial symptoms resembled rheumatic infection.

DR. SALISBURY CRAIG replies: The complaint of pain over the posterior aspect of the neck, the left deltoid region, and the left upper arm, together with the tenderness over those regions, were the initial features of the case which led the authors to suspect fibrositis. The subsequent development of mild pyrexia and pain in the left infra-axillary region, associated with the mitral stenosis, were regarded as further points in favour of a rheumatic infection.

PRURITUS ANI.

"CERONS" wishes to thank readers who have replied to his query about pruritus ani. So many (he says) have written to me about this distressing complaint that I find it difficult to reply to each one individually, and I hope that they will accept this formality instead.

A ROAD ACCIDENT.

MR. ARTHUR S. NICOLL (25, Ringstead Road, Catford, S.E.6) writes: May I endeavour through your columns to get in touch with the medical man who witnessed the accident to a motor cyclist and pillion rider, who were run down by a car, on the way to Hastings, on Sunday, June 22nd, about 12.30 p.m.? The doctor gave me his card at the time, but this has unfortunately been lost.

MEDICAL GOLF.

A British Medical Association Golfing Society for Sussex has been started, and the first meeting will be held on the links of the Brighton and Hove Golf Club on Sunday, September 28th. A competition of 18 holes under handicap against bogey will take place. The captain, Colonel Dee, is offering a prize for this. The honorary secretaries of the society are Dr. J. H. Twiston Davies and Mr. Harold Downer. All communications should be addressed to 40, Wilbury Road, Hove.

VACANCIES.

NOTIFICATIONS of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 42, 43, 44, 45, 46, 47, 48, 49, 52, and 53 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 50 and 51.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement* at page 27.

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